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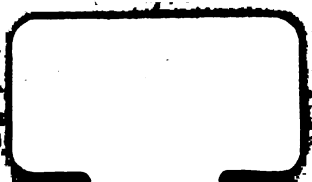
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MANUAL TRAINING MAGAZINE

EDITORS

CHARLES A. BENNETT
WILLIAM T. BAWDEN

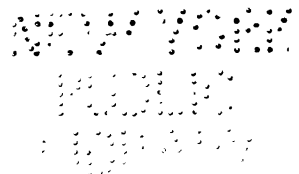
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MANUAL TRAINING MAGAZINE

SEPTEMBER, 1917

THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

WILLIAM T. BAWDEN.

Specialist in Industrial Education, U. S. Bureau of Education, Washington, D. C.

AS this number of the MAGAZINE goes to press it is announced in Washington that the Federal Board for Vocational Education has effected an organization and perfected arrangements that will result in the beginning of its official work immediately and with great energy and enthusiasm. The country has been plunged into the greatest war in history, and confronted with tasks and responsibilities that are making unprecedented demands on the resources and determination of both government and people; nevertheless, the summer of 1917 marks a new epoch in education. Not since the inauguration of the movement under the Federal Land Grant Act of 1862 have events occurred of greater significance educationally. It is an occasion of great rejoicing for all those interested in the progress of democracy in education.

As all readers of this MAGAZINE know, the Smith-Hughes Act was signed by President Wilson on the afternoon of Friday, February 23, 1917, while the National Society for the Promotion of Industrial Education was in convention assembled in Indianapolis. The Act provides for a Federal Board consisting of four ex-officio members—the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, and the Commissioner of Education—and three civilian members to be appointed by the President

and confirmed by the Senate.

On June 29th President Wilson appointed Arthur E. Holder, of Iowa, representing employed labor, for a term of three years, Charles A. Greathouse, of Indiana, representing the agricultural interests, for a term of two years, and James P. Munroe, of Massachusetts, representing manufacturing and commercial interests, for a term of one year. These appointments were confirmed by the Senate on Tuesday, July 17th.

The first meeting of the Board was held in Washington on Saturday morning, July 21st, in the office of the Secretary of Agriculture, at which time the three appointive members took the oath of office. At this meeting Secretary Houston was elected Chairman of the Board, and Commissioner Claxton temporary secretary. A temporary executive committee was organized, consisting of the Commissioner of Education and the three civilian members, to which committee was assigned the task of preparing preliminary plans and recommendations concerning business requiring immediate consideration by the Board.

The functions of the Board will be primarily to consider and adopt policies, interpret the law, establish standards and rules and regulations, and review the activities of the staff of experts to be employed by the Board.



DAVID F. HOUSTON, Secretary of Agriculture, is a native of South Carolina, educated at South Carolina College and Harvard University. From 1894 to 1902 connected with the University of Texas, the last three years as professor of political science and dean of the faculty; from 1902 to 1905, president of the Texas Agricultural and Mechanical College; from 1905 to 1908, president of the University of Texas; since 1908, chancellor of Washington University, St. Louis, Mo.; and since March 6, 1913, Secretary of Agriculture. His home is in St. Louis, Mo.



WILLIAM C. REDFIELD, Secretary of Commerce, was born in New York. Has been associated with a number of important manufacturing concerns, retiring as vice-president of the American Blower Company in 1913 to enter President Wilson's Cabinet. Was a director of the Equitable Life Assurance Society for eight years, served one term as Commissioner of Public Works for the Boro of Brooklyn, N. Y., and was a member of the 62d Congress, 1911-13. As president of the National Society for the Promotion of Industrial Education for three years, Mr. Redfield had a prominent part in shaping and securing the legislation which is now to be administered by the Federal Board. His home is in Washington, D. C.



Arthur E. Holder, a native of Wales, came to the United States in 1880. He is a machinist and operating engineer, and has been employed in all of the important industrial centers in this country. He also served as a marine engineer for three years, making three trips around the world, besides working at his trade in Europe and South America. He has been a trade unionist in good standing since 1875; president of the Iowa State Federation of Labor for three terms; deputy commissioner of labor for Iowa, three terms, and the first factory inspector in that State. Came from Iowa to Washington in 1906, since which date he has been legislative representative of the American Federation of Labor. This position he resigned to accept appointment on the Federal Board. His home is in Washington.



CHARLES A. GREATHOUSE is a native of Posey County, Indiana, and a graduate of Indiana State University. Began his teaching career in the country schools in Indiana, was county superintendent ten years, and state superintendent seven years, 1910 to 1917, a longer period than any other occupant of that office in Indiana. He is one of the large farmers and landowners in Indiana, was the organizer and president of a bank for a number of years, and also has important interests in the printing and publishing business. His home is in Indianapolis.

Note: The photographs on this page and the first two on the next were made by Clinedinst, Washington, D. C.



WILLIAM B. WILSON, Secretary of Labor, is a native of Scotland, coming to the United States as a small boy in 1870. From 1871 to 1898 worked in the mines. He was a member of the National Executive Board which organized the United Mine Workers of America in 1890, and held important offices in various labor organizations both before and after that date. He was a member of the 60th to 62d Congresses, 1907-13, serving as chairman of the House Committee on Labor in the 62d Congress. Secretary of Labor since March 5, 1913. His home is in Blossburg, Pa.



PHILANDER P. CLAXTON, United States Commissioner of Education, Department of the Interior, is a native of Tennessee. Graduated from the University of Tennessee, graduate student at Johns Hopkins, also one year of study in Germany. Began his teaching career as superintendent of public schools in Kinston, N. Carolina; from 1893 to 1902 was connected with the North Carolina State Normal and Industrial College; from 1902 to 1911, professor of education in the University of Tennessee and superintendent of the Summer School of the South. Appointed United States Commissioner of Education by President Taft, July 1, 1911. His home is in Knoxville, Tenn.



JAMES P. MUNROE, a native of Massachusetts, is a graduate of Massachusetts Institute of Technology, was for seven years secretary of the faculty, and has been since 1897 a life member, and since 1909 secretary, of the Institute corporation. Has been prominently identified with a number of Massachusetts philanthropic and educational organizations, also with several national associations, including the National Society for the Promotion of Industrial Education, of which he was president in 1910-11. Since 1889 a member of the firm, and since 1910 president and treasurer, of the Munroe Felt and Paper Company, Boston, Mass. His home is in Boston.



CHARLES A. PROSSER, was born in southern Indiana, graduated from DePauw University, and did advanced work at the University of Louisville and at Columbia University, receiving his doctor's degree from the latter in 1915. He was for eight years superintendent of public schools in New Albany, Ind., two years superintendent of schools, Children's Aid Society, New York; from 1910 to 1912, deputy commissioner of education for Massachusetts; 1912-1915, secretary of the National Society for the Promotion of Industrial Education; since 1915, director of Dunwoody Institute, Minneapolis, Minn. His home is in Minneapolis.

The Chairman was authorized at this first meeting to open negotiations with a suitable person to be employed by the Board as its chief executive officer, to be called the Federal director of vocational education. In this connection it should be noted, as a remarkable tribute to the capacity and recognized leadership of the man selected, that the unanimous choice fell, without debate, on Dr. Charles A. Prosser, director of the William Hood Dunwoody Institute, Minneapolis.

Dr. Prosser was called to Washington by telegram on Monday, July 30th, and spent several days with the Committee of the Board drafting plans for immediate action and a suggested scheme of organization for the staff.

At the second meeting of the full Board, held in the office of the Secretary of Agriculture, on Friday morning, August 3d, the committee made its report. At this meeting several very important steps were taken.

The plan of organization adopted provides for a standing committee, composed of the same persons as the temporary executive committee, which is to exercise a degree of delegated authority. The director is responsible directly to this committee and to the Board. The plan also provides, for the present, for five assistant directors, who are to be chiefs of divisions of agricultural education, in-

dustrial education, home economics education, commercial education, and research, respectively. A division to have charge of accounting and the administration of the office is to be organized, also an editorial division. All employees of the Board will come under the rules and regulations of the United States Civil Service Commission.

Dr. Prosser was appointed, and has accepted, as director, subject to the understanding that his relation to his present work in Minneapolis is such that he cannot remain with the Federal Board permanently. The Board of Trustees of Dunwoody Institute has been requested to grant Dr. Prosser leave of absence for six months, in order that he may pilot the new organization thru its initial and critical period. At the time this is written no other appointments have been announced.

A schedule of dates was adopted for a series of conferences in Washington with officials representing the several states which have accepted the provisions of the Act. The states will be divided into five groups, and a conference lasting two days will be arranged for each group. The series will begin with a conference on August 17 and 18 for the New England States, New York, Pennsylvania, and New Jersey.

WENTWORTH INSTITUTE: ITS PART IN TRAINING ARMY ENGINEERS.

GEORGE M. MORRIS.

Assistant Director of Manual Arts, Public Schools, Boston, Mass.

THE recent work of Wentworth Institute, Boston, is an example of the adaptation of a trade school's resources to the needs of war in training men for engineering service in the army.

Wentworth Institute was founded by Ariock Wentworth, a citizen of Boston,

"for the purpose of furnishing education in the mechanical arts." Since 1911 instruction in a variety of trades has been given to young men in both day and evening classes with excellent results. The instructors are men who not only have a thoro knowledge of their respective trades

but possess the rarer quality, the ability to teach. The equipment of the school is extensive and of superior quality. The shops and classrooms are well arranged, roomy and beautifully lighted.

With such resources, Arthur L. Williston, the principal, felt that the Institute could be of service in the training of

Militia, requested the privilege of recruiting men from the student body of the school. Mr. Williston, not only granted this privilege but offered to give all the cadets practical instruction in such courses as were related to army engineer problems. This offer was readily accepted and early in May classes for the cadets were formed.



FIRST CORPS CADETS, M. V. M., RECEIVING INSTRUCTION IN WOODWORK, WENTWORTH INSTITUTE, BOSTON, MASS.

engineers for the army. His opinion in this regard was supported by General Wood, who, when interviewed by Mr. Williston, expressed the belief that all members of an army engineering corps and all infantry and artillery officers would be much more efficient in present day warfare if they had such training as Wentworth Institute gave to its regular day students.

The opportunity for the Institute to render such service came when the First Corps Cadets, Massachusetts Volunteer

At this time the First Corps Cadets numbered about 600, the peace strength of the corps. To retain their organization and be accepted as a body by the war department, they had to increase their numbers to war strength and qualify as a regiment of engineers. To meet this condition about 400 recruits were carefully selected among volunteers from a large variety of mechanical and engineering industries, as well as from the graduating class of Wentworth Institute. As a result two-fifths of the regiment, now raised to war strength, was composed of specially

trained men. These recruits, acting as squad chiefs, gave valuable assistance to the instructors of the Institute in training men less experienced.

Evening classes for the cadets were formed at the Institute on May 5th. Three weeks later, upon the completion of the regular school term, day classes were opened to those who could spare day time for the work.

divide their time between two or more shops.

Timber construction included work with rough stock, as, for example, different kinds of spliced joints, keyed or bolted together, truss work as applied to bridges, pontoon building, signal tower and supply shed construction. Much emphasis was given to the organization of labor and the putting thru of large pro-



FIRST CORPS CADETS, M. V. M., RECEIVING INSTRUCTION IN AUTOMOBILE REPAIRING, WENTWORTH INSTITUTE, BOSTON, MASS.

The evening instruction included nine different courses: timber construction and woodwork, cement and concrete construction, topographical drawing and military surveying, gas and steam engine operating and automobile repair work, electric wiring, applied electricity, machine shop practice, mechanical repair work, and forging.

In assigning men to the different courses both the previous training and the wishes of the men were taken into consideration. Some men confined their attention to one shop while others were encouraged to

jects with carefully planned team work.

Concrete construction consisted of a study of materials, standard proportions to meet various conditions, hand and power mixing, reinforcing, form building and pouring. Such problems as foundations for heavy guns, parts of trenches, machine gun shelters and dugouts were considered and, as far as possible, carried out.

Topographical drawing involved reading and making road maps. The practice in surveying was according to military methods of pacing distances, sighting and

judging elevations and recording the results by use of tables prepared by the cadets to correspond with the individual's pace under varying conditions and grades.

In the gas engine laboratory the men were instructed to take apart and reassemble a variety of makes of automobile motors, and thus become familiar with the principles and the different types of construction. As the Ford motor is in general use for ambulance work, and as there are many Packard trucks with Pershing's army, these makes were given considerable attention. Such work as grinding valves, scraping bearings, replacing wrist pins, or piston rings and making other common repairs under pressure of time gives an idea of the practical nature of this in-

dynamos, generators, transformers, etc.

The machine shop work was largely confined to hand operations, such as chipping and filing, cutting key ways in shafting, scraping bearings, re-babbiting bearings, sawing, riveting, screw cutting, hand drilling, etc. The tie rods used in the



A MACHINE GUN SHELTER, BUILT BY FIRST CORPS CADETS, M. V. M., CAMBRIDGE, MASS.

struction. The steam power plant offered to men already somewhat experienced the opportunity to increase their efficiency in boiler and engine practice.

The electric wiring consisted of a study of circuits, switches, search light, telephone and telegraph instruments, and practice in the mechanical work of making the proper connections.

The course in applied electricity dealt with the electric machines such as motors,



FIRST CORPS CADETS, M. V. M., SOLVING A PROBLEM IN TRENCH DRAINING, CAMBRIDGE, MASS.

bridge work of the timber construction course were made in the machine shop.

The work of the mechanical repair shop was mainly for the purpose of giving men of little or no previous mechanical experience a familiarity with machines in general. Here they learned something about the different materials of which machines are made. By taking apart and re-assembling machines of various types a mechanical sense was developed, which made these men serviceable helpers to those more experienced.

In the forge shop men with training in such special lines as drop-forging, die-sinking, acetylene welding and power hammer work were given instruction in hand forging to better meet the conditions of army life.

The day students, about forty in number, were able to give to their courses at

the Institute an intensive application, some attending evening classes in addition to their six days a week. The work of the day students was largely confined to timber and concrete construction, topographical drawing, gas and steam engines, and electric wiring, these subject being considered of first importance.

The varied experience of the evening students and that of the recruits from industrial life, and the intensive work of the day students were all factors in making the regiment an effective engineering unit. There were many men who were specialists in a variety of occupations and more men who had a general knowledge of many lines.

When one considers the conditions on the modern battle field one realizes the value of such courses as here described. For gun foundations, machine gun shelters, dugouts and for a variety of other purposes both concrete and timber construction are essential. The topographical map is to the military officers what the chart is to the navigator. Electricity is extensively applied to such important necessities as the telephone, the telegraph, the wireless and other signalling apparatus as well as to pumps for removing water from the trenches. To supply the electric power a steam power plant, back from the firing line, is necessary. Nearby a machine shop, an automobile repair shop and a forge shop are all important factors in

keeping the machinery of a fighting force in running order.

As a part of the field activities of the Reserve Officers' Training Corps at Harvard, a system of trenches was dug near Fresh Pond, Cambridge. These trenches were turned over to the First Corps Cadets in order that they might have the experience of building a machine gun shelter and a dugout, draining a spring and working out a variety of similar problems usually left to the engineering corps. Here the French officers, in charge of the Reserve Officers' Training Corps, gave the instructors of the Institute the benefit of their experience in the present war. This meant much toward making the instruction of vital significance to the men in training.

Courses similar to those given to the cadets were offered to those members of the Reserve Officers' Training Corps in training for commissions, but, owing to the demands of the War Department the Harvard men could not avail themselves of this instruction, much to the disappointment of the French officers in charge.

Toward the latter part of June the First Corps Cadets were accepted by the War Department as an engineer regiment, but with the exception of one company, which was mustered into camp service July 2nd, the corps was allowed to continue its training at the Institute. At the time of writing the work is still going on.

—July 10, 1917.

When we require a boy to plane a board to a true level, or a girl to produce a pudding or a cake from a well-expressed, accurate receipt, we are training him or her to win moral effects on his or her character as well as a material result.

—CHARLES W. ELIOT.

NEW WINE IN NEW BOTTLES.¹

ALEXIS F. LANGE.

Dean of School of Education, University of California.

THE vocation to which every human being is called is that of becoming year by year more human; it is that of progressing from beasthood to the fullest and highest manhood or womanhood attainable. The master career is life. But if so, does not every one need the vocational guidance of knowledge, art, ideals of conduct, religion?

This statement cannot be separated from three corollaries, namely:

1. The making of a life depends, normally, on a surplus of health, on the vigorous functioning of our psycho-physical mechanism, whence physical education as a necessary means, likewise hygiene, personal and public, and perhaps eugenics and eutenics.

2. The making of a life involves the insight, the disposition, and the trained will needed for living with and for one's fellows. Every one lives, moves and has his being in social relationships. The man without a country cannot be a man. Whence training for effective citizenship as a necessary means of grace and growth.

3. The making of a life depends, normally, on a brain-guided occupation or calling, the first fruits of which are the economic well-being of the individual and of communities. Growing to full human stature is possible only for the worker—not for the beggar, the parasite, and the thief. Whence vocational education, so-called, as a third necessary means.

In view of the foregoing thesis and its corollaries, must we not conclude that our common task as teachers is to assist the young on the way to *thorobredness*, thru

action for action? Or, if we promise ourselves never to separate doing from being and vice versa, may we not rightly say that our common goal is social efficiency? Furthermore, if we are citizens of a democracy and accept, in theory at least, its educational creed—continuity and completeness of educational opportunities—can we fail to agree that we are all called upon, in the interest of the welfare of each and all to assist in bringing about the greatest possible efficiency of the greatest number?

Now, to come nearer home and to talk more directly about ourselves, what specific bonds combine the various groups of teachers here represented into one group? One of these bonds is furnished by the pupils, most of whom, for one reason or another, are near the end of their school days. Another is that the materials and activities serving as educational means are the oldest outside of school and the newest inside. Their perennially fundamental nature is well expressed by the poet as to one kind of these materials and activities:

We may live without poetry, music, and art;
We may live without conscience and live
without heart;
We may live without friends; we may live
without books;
But civilized man cannot live without cooks.

A third bond, implied in the poem, is the direct connection of our materials and activities with numerous callings or life-pursuits. A fourth is, of course, that our pupils must all manipulate tools on the stuff Nature yields with or without assistance. And a last bond is—since misery loves company—that we don't know very

¹Address presented at the Manual Arts Section of the California Teachers' Association.

well yet how to administer the new educational wine, and also that many of our professional brethren still object to our playing in the same yard with them.

These ties, however, seem to be only ties of fact. What is their meaning, their educational significance? Shall we not agree that they express the insistence of Democracy on completeness of educational opportunities for "all the children of all the people?" Have our subjects not become absolutely necessary educational means if national progress depends on the greatest efficiency of the greatest number? Does any high school adequately epitomize the civilization our pupils are expected to appreciate and to promote without these subjects and their kind? Are they not needed for the purpose not only of assisting boys and girls in efforts to find themselves and their work, but also of making it easier for them to get the vicarious experience which book-study implies?

Such considerations suggest to me some working principles of organization and method, not all of which will receive unanimous assent.

1. No high school student looking forward to the university should ever be encouraged to believe that our new subjects are not for him. In fact, unless he could show that his home life, as was the case pretty generally during pioneering days, was giving him a substantial equivalent, I should prescribe one or another for him, as a human being, as a future sure-footed and sure-handed thinker, and as an intelligent, systematic, cooperative citizen in a democratic commonwealth, and should thus assist him on the way toward thorobredness thru action for action.

2. No high school student whose formal schooling ends with high school graduation or before should have his chances to make a life as well as a living curtailed. We commit a crime against him if we

regard him as merely an economic device, a means to a livelihood, as a tool for Capital to use and to exploit, and then organize a course of study and training which prevents him from winning possession, as far as he is able, of his rightful heritage, i. e. knowledge of man and nature, art, and thought-out ideals of individual and social conduct. Then, too, unmitigated and too early specialization results in employes not in masters, in dependents, not in free men. Moreover, while national progress depends on specialized skill, it depends even more on a people's general social efficiency, i. e. on the height of the plane on which the greatest possible number of citizens are able to meet in thinking, feeling, and hence willing. Specialization alone is the right thing for a despotism that wants to maintain itself.

3. In organizing these new subjects for purposes of instruction two pitfalls are to be avoided. One of them is that of trying to teach subjects instead of teaching boys and girls. Would so many students feel that the traditional subjects are not worth while if their teachers did not isolate these subjects from every human interest present or to come, except that of the professional specialist? If these teachers kept their eyes on their pupils and on the far goal of all education, would not the physics teacher recall that physics developed out of the use of tools and mechanical appliances, and the chemistry teacher that chemistry had its origin in the processes of dying and bleaching, and the mathematics teacher that geometry means earth-measuring? Might it not happen then that each would utilize the pupil's daily life and that of his community, and by problems of knowing and doing make him realize that the physical world is intelligible, and that man by setting thought to work has compelled Nature to serve

him? Something analogous to this holds for every other of the traditional subjects, even for Latin.

Teaching boys and girls by means of subjects rather than subjects by means of boys and girls will prevent us from dropping into the other pitfall—that of making manual dexterity the Alpha and Omega instead of regarding it as a necessary result or by-product. In the long run, the most practical things are always those powers and qualities that may separate human beings from trick-dogs, such as the ability to get at underlying principles and then to apply them; judgment, imagination developed thru the possibilities of actual situations, courage to say no to one's self, forms of behavior that facilitate social intercourse, etc. Such powers and qualities are truly practical both in making a life and in making a living. We must see, further, I think, that each of the numerous vocations for which the new subjects may serve as foundations, means so much more than technique. Each means a mode of life. Farming, for example, does not mean merely raising crops or cattle. According to who and what the farmer is, it means a good or a bad or an indifferent business. It may mean a home, sanitary, comfortable, and beautiful; or it may mean a pig-sty. It may mean no resources of thought beyond the daily labor; it may mean a steadily increasing participation in the best that is being thought and said and done in the world. And so we are obviously not giving our pupils a square deal if we dissociate technical processes and activities from the life implied, and the life implied from its connection with the inclusive life of the state and the nation. Moreover, while pupils are learning to apply intelligence, under expert guidance, to the arts, until recently acquired thru imitation or a rule-of-thumb apprenticeship, should they not learn also to apply

intelligence to traditional or existing economic and social settings for these arts, in order that they may take with them into their vocations better ways of doing better things in the management of life as a whole? One of the special functions of those interested in vocational guidance might very legitimately and desirably be that of furnishing information concerning vocations as modes of life both as to what they now are and what they may be made.

Our new wine, as intimated, in order to develop its full potency and characteristic flavor, requires appropriate new bottles. Here is a challenge and a great opportunity, be the difficulties encountered ever so great. The nature and setting of the new subjects and their appeal to youth are such that we can do more than any one else toward making school life a continuation or expression of adult community life at its best, and the starting point, directly and indirectly for its improvement. We are especially called upon to forge new links between the school and the home, the farm, the workshop, and the best community institutions for social intercourse and recreation. By and by we can perhaps—the hardest task of all—put the fear of the Lord, if not life, into the academic teacher, so-called, and assist thus in making every high school subject and the whole high school community life promote for every pupil the making of a life. The school must form a whole with the rest of life.

You will have observed how carefully I have avoided speaking of the subjects under discussion as vocational subjects. I have done so because I believe staunchly in vocational education to a finish for everybody. I have done so because the new wine should not be put into old bottles, and, as a matter of fact, can't be put into old bottles, i. e. the traditional school system, due to an accident of his-

tory. If we want to be really practical, if we really wish to be democratic and so to secure the greatest possible general and special social efficiency, we must reshape traditional arrangements to meet new needs, however many makeshifts we have to resort to while the old is being transformed into the new. We of these groups should, therefore, be greatly interested in two reorganization movements—the intermediate school and the junior college movement. Both imply another, the movement to make the county instead of the district the educational unit. With the intermediate school a fact in every county as well as in every city, it would be possible gradually for these large units to make the intermediate school the basis for specialized vocational training, thru subsequent courses of varying duration, thru continuation schools and extension service, cooperation with corporation schools, etc. This would offer the chance for a complete education to the many who will not, cannot, should not attend a high school. The same large units would develop vocational departments in junior colleges for what might be called the middle tier of occupations. An agricultural department in a county junior college, for example, could do what neither the four year high school nor the university can do. The four year high school would, of

course, retain its great function of laying vital foundations.

Such development would greatly facilitate the organization of vocational guidance. Each city and each county could have its vocational guidance bureau with an expert teacher at the head of it. Him the teachers of the schools within his field of operation would assist in every way possible. Ordinarily they would refrain from acting as vocational guides themselves. It is a fine thing to have teachers in every school who ask as the parents of John the Baptist did: "What manner of child shall this be?" and then try to find out all about the child and about the occupations for which the child may possibly be headed, naturally. The greatest benefit, however, consists not in connecting the child with a job but in the dividends the teachers get from this investment of concern for the child's future. Knowing the pupil and the actualities of life better, they are not likely to become "bone-dry."

All I have said has been backed by the conviction that the teachers of the new subjects have every reason to make the most of these subjects and also to give themselves the breadth of outlook, the depth of insight, the appreciation of everything that is good, and the intelligent sympathies with fellow-workers in other fields of education that the teachers of the traditional subjects ought to have.

We want to invigorate and reinvigorate education. We want to create a sustained counter effort to the perpetual tendency of all educational organizations towards classicalism, secondary issues, and the evasion of life. —H. G. WELLS.

A STUDY OF GAS ENGINES IN HIGH SCHOOLS.

HARRY W. ANDERSON.

Instructor in the Engineering Extension Department, Iowa State College, Ames, Iowa.¹

DURING several visits to the homes of some of the boys living in the country it has come to my notice that at least one and sometimes as many as five gasoline engines were in use on one farm. Gasoline engines pump the water, generate the electric light current, run the churn, and separator. The lady of the house sits in the parlor listening to the

fundamental principle upon which it worked. With the wide application and increasing use of the gas engine it seemed obvious that some instruction in the theory, care and operation of internal combustion engines should be given in schools. Such instruction can be justified as being a phase of the community's industries, and also as finding its application in the stu-



GAS ENGINE CLASS, GRANT VOCATIONAL SCHOOL, CEDAR RAPIDS, IOWA

form or other, but not one knew the "Barcarolle" or "The Ragtime Pipe of Pan" on the Victrola while an engine is puffing away, furnishing the power for the washing machine. The application of the gas engine is everywhere apparent in the automobile, truck and tractor. In rich farming regions, such as found anywhere in the state of Iowa, the gasoline engine and its applications are indispensable to the up-to-date farmer. Almost every boy in the author's classes had come in contact with the gas engine in some

dent's later life when he perhaps will have a motor car or motor boat of his own.

It was first realized that, in order to give proper instruction in gas engine practice, an engine was a prime requisite. A 2½ H. P. Galloway engine was forthwith purchased and installed. It was equipped with an oscillating magneto because this type is very commonly used on farm engines. Extra parts were obtained and mounted to show the main parts of the engine. A set of blue-prints can usually be obtained to further show the construction of the engine, and also to get dimensions and to make some calculations from later on.

¹This article was written while Mr. Anderson was in charge of the manual training at Vinton, Iowa.

When the engine was uncrated and set up in the shop, of course everyone wanted to get it going without any preliminary theory or other delay. Several charts were made in permanent form; four each, illustrating one stroke in the cycle of a four-stroke cycle engine, two of the two-port, two-stroke, and two of the three-port. Each chart was made of wallboard, $2\frac{1}{2} \times 4$ ft. in size, and drawn in crayon. Other charts were obtained; such as, full-size and sectional views of the Delco light plant for generating current, sectional views of automobile engines, etc. These were mounted on wallboard for permanence.

As a basis for the course in theory the outline in gas engine theory prepared by the Extension Division of Iowa State College and Heacox, "Gas, Gasoline and Oil



CLASS STUDYING GAS ENGINE AT FIRST HAND.

Engines" were used. The material in gas engine theory was given as a series of lectures covering a period of two weeks. The boys were asked to bring note-books and take plenty of notes during the course of the lectures. Several short "quizzes" were given intermittently. Upon the completion of the series of lectures a written test on the theory of the gas engine was given.

Many discussions took place during the progress of the instruction and the author was thankful for several summers' experience in auto factories which helped to

settle many mooted points. What some of these Iowa farm lads who have had a car for years think of to ask proved to be a trying cross-examination at times. The



CLASS IN GAS ENGINE THEORY. NOTICE THE WALLBOARD CHARTS.

discussions helped to increase the interest and enlivened the otherwise cold theory. Many of the boys brought automobile engine parts so that a large collection of carburetors, magnetos, spark plugs, etc., are now the property of the shop for use in the future.

The course in theory, in brief, is as follows:

The Four-Cycle Gas Engine

- Nature of explosion
- Cycles
- Four-stroke cycle
- Mechanism of gas engines
- Cylinder cooling
- Ignition
 - Hot tube
 - Make-and-brake
 - Jump
- Order of events
- Clearance and compression
- Governing
 - Hit-or-miss
 - Throttling
- Muffler

The Two-Cycle Gas Engine

- The two-stroke cycle
 - Two-port, two-stroke engine
 - Three-port, two-stroke engine
 - Combination type
 - Bessemer engine
 - Koerting engine

Heat and Work

- Heat, the source of energy
- Explosion of gases
- Effects of combustion
- Heat
- Conversion of heat to work
- Measurement of heat
- Energy
- Mechanical equivalent of heat

Horse-power commutation
Heat losses in a gas engine

Horse-Power of Gas Engine

Power measurements
Indicated horse-power
Indicators
Indicator diagrams
Brake horse-power
Mechanical efficiency
Thermal efficiency
Horse-power ratings

Oil Engines

Types of oil engines

Carburetors and Mixing Valves

Mixing valves
Gasoline
Principles of vaporization
Carburetors
General valves
Auxiliary air valves
Mixture troubles

Governors and Fly Wheels

Function of a governor
Methods of governing
Quantity regulation
Quality governing
Speed regulation
Flywheel regulation
Flywheel speeds

Ignition

Open flame
Hot tube
By heat of compression
Electric spark

Starting

*Lubrication
Valve Setting*

When working volume, piston displacement, clearance space and cylinder volume were discussed these were computed for the shop engine. Problems covering these same points in the Ford and Cadillac engines were also given. Other problems suggested themselves which served to reinforce the theory.

A Prony brake was made, and the delivered horse power of the engine was calculated. The term horse power then meant something to the pupil. In using the Prony brake it is necessary to keep the rim of the fly-wheel cool, which can be done by keeping a stream of water on it while the engine is running.

An indicator is hardly within the reach of the ordinary high school, yet it might be possible to borrow one for a time. It was not our good fortune to obtain one,

so a short discussion of the principle of the indicator was all that was given.

Upon completing the work in theory, some instruction was given in starting, operating and caring for an engine of the type used. All students in the class were given a chance to start the engine, and run it for a while. The real interest, however, was displayed when the class was divided into groups of four to be allowed to partially take the engine apart. The most capable lad in each group was appointed as foreman, with the responsibility of seeing that the group did the work carefully and that no parts were broken. The engine was then reassembled. After each group finished the tearing down and reassembling, the boys were asked to write a paper naming the various parts and describing the process. In this way the student obtained some good, first-hand knowledge of the gas engine. He is not apt to forget what he has learned by actual contact with real engines.

The applications of the gas engine furnished the bases for several discussions. Some of the boys were delegated to give talks on the part gasoline engines are playing in the European conflict. All this was the more interesting because of the fact that an ambulancier from the American ambulance corps in France had recently given a lecture in the city.

From every standpoint the work in gas engine practice has been of value. At this time, when many boys are going to the farm, they will, no doubt, have plenty of opportunity to apply their recently acquired knowledge. Then again, three of the boys have joined the aviation corps of the army. Who knows but what the drill in gas engine theory, etc., will prove a substantial foundation for effective service in the air fleet!

While gas engine practice may not be essential in some schools, as it fits the

needs of some groups of boys more than others, yet it hardly needs an excuse for entering the course of study of the shop. It will give the student some valuable knowledge which he will at some time or other make use of and which he would probably never acquire in any other way.

—*Books for Study and Reference:*

Robert's Gas Engine Manual,
Gas, Gasoline and Oil Engines,

The Gasoline Engine on the Farm.—Xeno W. Putnam.

Gasoline Engines, Their Use and Care—A. Hyatt Verrill.

Modern Gas Engine and Producer Plants—R. E. Mathot.

The Modern Gas Tractor—V. W. Page.

The Modern Gasoline Automobile—V. W. Page.

Manufacturers Catalogs and Inspection Charts.
Land and Marine Diesel Engines—Giorgio Supino.

Aero Engines—G. A. Burlo.

Internal Combustion Engines—R. L. Streeter.

THE N. E. A. MEETING AT PORTLAND, OREGON.

THE Portland convention, July 7 to 14, was a success. It was well attended, considering present conditions and the distance from the homes of a great majority of the nation's teachers. The war demands upon the men accounted for the fact that the Portland meeting was decidedly a woman's convention; many of the leading speakers were women; the audiences were largely made up of women; and a woman, Mary C. C. Bradford, State Superintendent of Public Instruction in Colorado, was elected president for the coming year.

As would be expected, a strong note of patriotism was heard at the meeting, and this reached its climax at the general session when the members of the Belgian Mission appeared on the platform. "The great ovation began," said the *Oregonian* in reporting the event, "with a little old lady in the third row front. Rising from her seat she waved at the party, and cried, 'Vive la Belgique!' A score of compatriots scattered throughout the audience took up the cry. Swiftly it flashed into English until the great hall rang to the volume of feeling."

Both the president of the Association, Dr. Robert J. Aley of the University of Maine, and the president-elect spoke of the great service the schools have rendered in preparing for the present world struggle

for democracy, and of what they should render in the reconstruction of the world after the war is over. Many other speakers gave expression to similar ideas.

The three sessions of the Department of Vocational Education and Practical Arts were especially well attended. It was estimated that 400 were present at the first session, 500 at the second, and 212 were counted at the third session.

In opening the first session, the president of the Department, W. J. Borgan, principal of the Lane Technical High School, Chicago, spoke briefly of the past work of the Department and of the outlook for the future. He emphasized the great importance of the work of the teacher of practical arts subjects at all times in developing efficient citizens, and then placed particular stress on the demands of the nation at the present time for a united effort to be directed toward the development of a more efficient system of practical education.

Among the topics discussed were vocational guidance, industrializing the manual arts, training teachers for vocational schools, and art instruction as related to industrial training. L. W. Bartlett, vocational adviser for the public schools of Pomona, Calif., discussed the first of these subjects. His point of view was expressed in these two paragraphs:

As a part of the school system vocational guidance should be definitely organized and supervised. Small systems in cities of ten thousand should have an adviser devoting full time to the work; large city systems should have a supervisor with assistants in the several schools constituting a bureau.

Vocational guidance should be a distinct function of the entire system, belonging to all the departments, and continuing thruout the school career of the pupil. Special emphasis, however, should be given just before the child reaches the work age, or passes into the high school; and again in the senior year when the pupil is face to face with vital life problems.

George H. Jensen, director of the pre-vocational school work at Stockton, Calif., spoke on the subject "Industrializing the Manual Arts." He said that a new and broader conception of manual training must be developed. Along with the manual training and as a part of it must go the elements of practical training for industrial pursuits. But he added, "Methodical doing has been one of the distinguishing ear-marks of manual training from the time we first began to work at our courses as a result of the Russian and Swedish practices. In spite of the fact that we must industrialize our manual training, we shall never realize our ideal unless we keep strictly in mind that methodical doing must ever and always be a vital consideration."

As specific suggestions he recommended giving more attention to the study of woods and finishes. He believed in concrete pottery; he said that every school should have a print shop; he approved the teaching of electrical construction and the study of motors.

Frank H. Shepherd, associate professor of industrial education at the Oregon State Agricultural College, took high ground with reference to the training of teachers for vocational schools. His address is suggested by the following quotation:

The vocational teacher must have skill plus teaching ability, education plus the power to inspire educational activity. He shall not be eligible to teach until he has had preparation in the trade of teaching. He shall not be eligible to teach a trade until he has acquired skill in that trade. For vocational education is only an attempt on the part of the teacher to have done in the right way instead of the wrong way things which have to be done one way or the other.

"The Relation of Art to Vocational Education and Manual Training" was the title of an address by Ben W. Johnson, director of manual and industrial education, Seattle, Wash. Mr. Johnson said that art and manual training should be very closely connected. With the growing significance of the social meaning of education has come a new meaning to the manual arts as an element in education. In this enlarged field "manual training is the vehicle for the instruction in art applied to industry."

The power and the desire to do, and the appreciation of what is done by others cannot be better developed in the growing child than by the manual arts.

The adaptation of forms to spaces, using tool, pencil, and brush, will for every child start his interest toward appreciation, and for the exceptionally gifted one, awake him to the possibilities of the fine arts in architecture or painting. In any event, the great majority of the pupils are to be appreciators of art rather than producers in any technical sense. Not only by taking some part in creative production, not solely for the production of beauty, but for the expression of strong desires or feelings can a wholesome and natural attitude of appreciation be developed.

Good manual arts should be good industrial design, for the object should adequately fulfill its purpose; its workmanship should be skillful and its construction consistent; the materials should be adapted to the end sought, and their qualities for beauty in form and color and arrangement be fully utilized; and when consistent with the service, ornament may be devised so as to further reinforce the service of the object.

Such a consummation of art and of manual training as educational means is not magnifying the one above the other, but is the correlation in the spiritual unfolding of the child to the world filled with beautiful things. Fulfilling such a function, which they should, they will be given the all-important place in the curriculum that they occupy in the scheme of things in life.

In conclusion, Mr. Johnson said:

The relation of art to vocational and manual training is determined by our conception of art.

If it has to do only with the luxuries, superfluities of life that the leisure class can enjoy, we need spend little if any time upon it in the public schools. If it is what I believe it is to be in our schools, a fundamental factor in every individual's living, a means of expressing thought, emotion, ideals, the individual's desire to communicate and cooperate with others, then it deserves to be given very much more consideration in the school curriculum than it now receives. The vocations requiring art training are comparatively limited, but there is more need for art instruction to give appreciation of and enjoyment in the work of others. Manual training as a part of general education is the best means for giving a beginning in art instruction as applied art or industrial art. And finally the value of these applied arts is not to be measured in intellectual terms. Thought, feeling, the emotions, if you please, having an ideal and striving to realize it, are possible of expression in the work of the hands, without any other intellectual expression. The clothes we wear, the homes we make

for ourselves, the work we do, the recreations we seek, are all evidences of our standards of art, of aesthetic refinement. Thru these things we also express our desire for the approval of others, to please others. Our motive is in the last analysis social. Art then is for the very great majority the simplest way—more so than thru the written or spoken work, for self expression to others.

The Department of Vocational Education and Practical Art elected the following officers for the coming year:



FRANK H. SHEPHERD, PRESIDENT OF THE N. E. A. DEPARTMENT OF VOCATIONAL EDUCATION AND PRACTICAL ARTS.

President, Professor F. H. Shepherd, State Agricultural College, Corvallis, Oregon.

First Vice President, Professor Arthur W. Dow, Teachers College, Columbia University, New York City.

Second Vice President, Adelaide Steele Baylor, State Supervisor of Household Arts, Indiana.

Secretary, Lester W. Bartlett, Vocational Adviser, Pomona, California.

At a meeting of the Board of Trustees James W. Crabtree of River Falls, Wisconsin, was elected secretary of the entire Association to take the place of G. W. Springer who has held that office during the past five years.

It is probable that the meeting next year will be held in Milwaukee, Wis.

*Because a man has a shop to mind
In time and place since flesh must live,
Needs spirit lack all life behind,
All stray thoughts, fancies fugitive,
All loves except what trade can give?*

—BROWNING.

EDITORIAL REVIEW OF THE MONTH

LOYALTY OF THE SCHOOLS

NO one questions the loyalty of the schools of the country. When the call came for men to enter the army and navy the schools and colleges were quick to respond. College men enlisted by the hundreds and thousands. High school boys who had reached the age limit for the navy left their books for the discipline of the training station. When the call came for farm workers the schools responded so generously that the summer schools registered only about fifty per cent of their usual quota of men students. The response of the schools has been prompt and generous; it has been genuinely patriotic. This is as it should be; we take satisfaction in it. But what now?

EFFICIENT SERVICE

WHEN President Wilson made his appeal to the American people on the 15th of last April he gave an interpretation of patriotic service that school men should remember. He said, "Patriotic service does not of necessity mean the making of shells—Our industries on the farm, in the ship yard, in the mines, in the factories, must be made more prolific and more efficient." "Industries more prolific and more efficient!" That means industrial education and much more of it. It means promptly carrying into effective operation the Smith-Hughes law; it means focussing our industrial training upon essentials instead of scattering our efforts; it means holding the boys in school until they are well trained. This war demands experts, and the schools will miss a great opportunity to serve their country if they do not catch the spirit of the President's

appeal at once and redouble their efforts in the direction of effective practical training. The school year now opening ought to witness the most remarkable development in vocational education that this country has ever seen.

DANGER OF LOWERING STANDARDS

COMMISSIONER Claxton of the United States Bureau of Education has recently issued a warning against undervaluing the schools in such a time of national stress. He says, "It is of the utmost importance that there shall be no lowering in the efficiency of our systems of education." He points out that if the war should be long and severe there will be great need for men of scientific training and practical skill, and that after the war is over the demand for such men will be even greater than ever before, for this country must play a larger part than ever before in the agriculture, manufacturing and commerce of the world. Effective vocational education is not merely a war measure, tho it is that now; it is also an after-war measure of great moment to this nation. "After the war the world must be rebuilt."

SCHOOL CHILDREN CAN HELP SOME

KEEPING up the standards of the schools and keeping in school many of the larger boys who might be useful in industry does not mean that the children of school age should be prevented from rendering service in this national emergency. Commissioner Claxton suggests that "during school hours and out of school, on mornings, afternoons, Saturdays,

and during vacation all older children and youth should be encouraged and directed to do as much useful productive work as they can without interfering with their more important school duties. This productive work should be so directed as to give it the highest possible value, both economically and educationally."

This means another opportunity for the manual arts teacher, and he should not be slow to recognize it. But in his enthusiasm for material results, he should not forget the educational, and especially not forget the health results. In this he should take warning from England, some of whose school children have been required to bear war burdens that have proved excessive.

A recent number of *Education* tells of an investigation of the "effects of holiday war work upon school boys" made by the Association of School Medical Officers in England. The report states that "as a rule, boys who had been at work for a few hours daily and under good hygienic conditions appeared to have suffered little or nothing from the experience. On the contrary, where the work was excessive or performed under bad conditions, the boys on their return to school seemed weak, incapable of application, and in unusual numbers had to be cared for in the school hospitals. In a measure these unfortunate effects were attributed to the lack of sleep, a matter which requires close attention as many boys do not have sleep enough during the school term and make it up in the holidays. Boys who worked in the open air and under favorable conditions were benefited. With regard to munition work, the medical officer, who summarized the observations, declares that in the sense of the manufacturer of high explosives and shell filling, this work should be altogether avoided in the case of boys."

CHILDRENS' WAR WORK SHOULD BE EDUCATIVE AS WELL AS PRODUCTIVE

SOME of the elements of practical education which may be brought into school work thru war activities are pointed out by Arthur H. Chamberlain in the June number of the *Sierra Educational News*. Mr. Chamberlain summarizes an investigation of the food production work being undertaken this summer by the schools of California. He then mentions what is being done in other states, discusses several vital features of such work and ends with several significant recommendations. He recommends: (1) Agricultural instruction should be given in all schools. (2) Instruction in home economics should be regarded as a fundamental necessity. Only in this way can waste in foodstuffs be prevented. (3) Each school should have its employment bureau. (4) The products of school gardens should be made use of in classes in home economics and in school lunch rooms. (5) Boys and girls should be taught the value of money—how to save, how to invest, how to spend. (6) Thru the "gospel of work" children should be lead to see things as they really are in life.

And why not? Is there any reason why at this stage in our industrial education development we should fail to utilize this war work—this demand for patriotic service—as a means to an educational end that has long been recognized as lacking in our educational system. This may be the silver lining which we should look for and see in the present cloud that is over us. Have we not been asking that the children spend more time in practical handwork? Now that they are going to do it, let us see that it is done so as to serve the nation thru the indirect or training products of labor as well as thru the direct or economic products of labor. And

this can come only when the labor is under such educational supervision as is most appropriately supplied by the school organization.

STIMULATING EXAMPLES OF PATRIOTIC SERVICE

On the 18th of June, President Wilson addressed a letter to Secretary Redfield passing on the suggestion which had come to him that it would be desirable for the vocational training schools of the country to keep open during the summer to train young men under military age either to fill the places of men in the industries who are withdrawn for military service or to fit more men to enter the special occupations called for by the war.

Following in line with this suggestion, the U. S. Commissioner of Education, Dr. P. P. Claxton, sent out an appeal to parents and school officers urging among other things an increase in continuation school work and better facilities for technical training. When the National Society for the Promotion of Industrial Education held its conference of state administrators of vocational education in New York on the 13th and 14th of July, resolutions were passed recommending "that evening trade and vocational schools now generally closed thruout the country for the summer vacation period should be reopened immediately to serve the present war need for the training of mechanics and technician," and that evening vocational schools be opened earlier this year than usual.

Among the schools offering special war emergency courses the following have come to our attention: Pratt Institute enrolled over 300 students for machine work and machine drafting in a ten weeks' course beginning July 9th. Courses in ship drafting and ship calculations were organized, and 120 men are being trained

as army telegraphers, and 320 men are taking courses for navy electricians. Dunwoody Institute, Minneapolis, offered courses for electrician, radio operators, telegraphers, gas engine experts, motor truck drivers, bakers, cooks, and machine shop workers. Up to the middle of July more than 1,000 applications for enlistment had been received. The Pennsylvania State College gave instruction in storekeeping under army direction. Thirty men were enrolled. Iowa State College gave a six-weeks' course in military and military engineering work. Armour Institute, Case School of Applied Science, Massachusetts Institute of Technology, Stevens Institute and the Ranken School of Trades are other institutions assisting in special war work. The work done at Wentworth Institute in Boston is described elsewhere in this issue.

Officials of public and private schools who are anxious to render patriotic service in the present crisis, and who say they are only awaiting definite suggestions as to what they may do, may well consider the aggressive action of these private institutions. With characteristic energy and directness of action these schools have offered their services to the Government for the accomplishment of specific tasks which were within their capacity and which were perceived to be urgently needed.

TYPES OF WORKERS NEEDED IN THE INDUSTRIES

AMONG the facts brought before the conference of of state directors of vocational education in New York City, July 13th and 14th, were the following which seem to summarize the present situation:

According to C. E. Downton, superintendent of labor for the Springfield, Mass., plant of the Westinghouse Company, approximately 80

per cent of the labor force in a munitions plant consists of machine operatives or other semi-skilled workers. A large force of such workers may be recruited in a reasonable time by careful selection from unskilled labor. The greatest contribution the vocational schools can make in the present emergency is to offer for the more promising high-grade mechanics, such as tool-makers and others who already have the requisite skill, special courses in the technical knowledge related to the industry and in elementary principles of shop management and routine, with the object of preparing them as quickly as possible for effective service as foremen.

The related technical knowledge required includes study of such topics as the heat treatment of metals, mathematics, special drafting, etc. To enable the vocational school to render this service effectively, carefully chosen instructors should arrange at once to spend some time in the factories. A capable instructor who has had trade experience should be able to acquire in a few weeks in the factory a sufficient grasp of the details of industrial processes and of the requirements of the foreman-to-be. If this action is taken promptly, the courses can be organized and offered early in the fall in the industrial plants or in strategically located vocational schools.

Speaking for the metal shipbuilding industry, H. G. Smith, general manager of the Fore River Shipbuilding Company, Quincy, Mass., said that about one-third of the labor demand is confined to certain ironworking trades peculiar to shipbuilding. In these special trades, it is estimated that 50,000 more men will be required during 1917, and probably 100,000 additional in 1918 as construction plans are matured. Every one of these trades is susceptible of more or less definitely organized courses of instruction.

Some of the more important of these trades are: loftsmen, shipfitter, shipwright, rivetter, caulker, etc. No more skilled men in these trades are now to be had. The thousands that are needed must be trained. The vocational school can help definitely, in two ways: (1) teach others how to teach, i. e., organize courses for making foremen out of skilled mechanics; (2) help turn out skilled mechanics in some of these shipbuilding trades.

In some of the important trades, the equipment that would be required in the schools, and

the materials for manipulation, are far from prohibitive in cost. To make the course effective, the teacher should make a careful study of the processes in the plant, and gain some first-hand experience.

It was asserted that industrial plants generally will be found ready and eager to cooperate with the vocational school in any well-considered plan for training skilled workers, though the discussion brought out very clearly two reasons why the industries cannot meet the situation unaided: (1) the pressure for production is so great that skilled men simply cannot be taken off in large numbers to serve as instructors of the new recruits; (2) the demand for skilled mechanics is so keen that competitors are systematically enticing men away from the better organized plants after they have been trained for any special work.

BURIED among the market reports and classified advertisements on the twentieth page, last column, an obscure paragraph of ten lines in a Washington evening paper on June 29th announced without comment the nomination by President Wilson of the three appointive members of the Federal Board for Vocational Education. A due sense of appreciation of the national importance of events would have found space for this announcement on the front page. It should have had at least as much prominence as the thrilling tale of the ship's crew that positively identified a larger sea-going whale off the Grand Banks as a German submarine.

A NEW SOURCE OF HELP

SOME time ago we received two of the most attractive educational pamphlets that have ever come to our desk. One was entitled "Playthings" and the other "Study of Animal Families in Schools." They came from the Bureau of Educational Experiments, 70 Fifth Ave., New York City. We wrote at once for further information and have just received a pamphlet stating the purpose of this new

source of inspiration. The Bureau of Educational Experiments is intended to be "a clearing house of educational ideas. Its purpose is to collect material that is concerned with the scientific study of education, and by publications and exhibits, make it easily available to people who are interested." The two bulletins referred

secretary, and a dozen others who are "engaged in first-hand efforts to improve education, and who have all shared in the general movement that has brought about a more scientific study of children."

We may confidently look to this Bureau for more help in the future.



DESIGNS RECEIVING THE FIRST AND SECOND AWARDS FOR A MEDAL TO BE DISTRIBUTED EVERY YEAR IN EACH OF THE 24 HIGH SCHOOLS OF NEW YORK CITY BY THE ART IN TRADES CLUB. THE PURPOSE OF THE MEDAL IS TO STIMULATE INTEREST IN INDUSTRIAL DESIGN. THE WINNER OF THE FIRST PRIZE FOR THE MEDAL DESIGN WAS GUISSIPPE CECERE; OF THE SECOND PRIZE, FREDERICK B. CLARKE.

to, No. 1 and 2, are a part of the plan to facilitate the exchange of material. Four additional bulletins are already announced. One of these is priced at 25 cents; all other are 10 cents each.

The Bureau has adequate funds at its disposal to make possible a program of work extending over a term of years. Something more of the spirit and purpose of the Bureau becomes evident when the personnel of its members is known. The honorary members are Mrs. Frederick S. Coolidge, Professor John Dewey and William A. Wirt. The working council includes Lucy Sprague Mitchell, chairman, Harriet Merrill Johnson, general

STOUT INSTITUTE OFFERS A DEGREE COURSE

THE State of Wisconsin has passed a law authorizing Stout Institute to offer four years of work for the training of teachers in the industrial and household arts. These courses lead to the B. S. degree. Early last winter Dr. L. D. Harvey, president of the Institute recommended that the Board of Trustees of the Institute ask the Legislature to enact such a law. The bill passed with only one vote against it in either house. The bill carried an appropriation for additional laboratories and equipment for the new

courses and for additional teachers. The Institute will begin this month on the four-year scheme, but it will not abandon its two-year courses.

This action at Stout Institute is intended to meet the growing demand for teachers in high schools with the more extended preparation represented by a college degree. Special attention will be given to the training of teachers and directors of continuation school work.

HENRY TURNER BAILEY GOES TO CLEVELAND

TO the average individual an art museum does not possess an inviting atmosphere. It seems to make an appeal only to the favored few, whereas it should occupy a place in the lives of the people second only to the public library. It has remained for the city of Cleveland, Ohio, to inaugurate plans whereby the traditional history of the art museum shall be changed. The city is fortunate in possessing a school of art and a museum of art, the latter under the able management of Frederic Allan Whiting. In order to make these art-developing agencies contribute their full quota to the life of the city, the trustees realized that a man of large vision, with full appreciation of the problem, and possessing the necessary organizing ability, should be chosen to direct a part of the work in both institutions. For this task Henry Turner Bailey has been elected dean of the Cleveland School of Art and superintendent of educational work at the Cleveland Museum of Art. No other man that we know possesses in the same degree as Mr. Bailey all the qualities of mind and heart that this unique position calls for, and the trustees and the city of Cleveland are to be congratulated upon their choice.

Mr. Bailey is a graduate of the Massachusetts Normal Art School, and was

the first agent of the Massachusetts State Board of Education for the promotion of industrial drawing, having held this position from 1887 to 1903. He has represented the United States in two international art congresses, one in Brussels in 1898 and the other in London in 1908; he was also a member of the International Jury of Awards at the Panama Pacific Exposition in 1915. But he is best known as editor of the *School Arts Magazine*, thru the columns of which he has been a constant inspiration to the drawing teachers of this country for many years, and has influenced the development of elementary art instruction in several foreign countries. Mr. Bailey is a teacher of unusual power, being able to establish with students, a sympathetic relation accompanied by a spirit of encouragement that continually calls forth their best. As citizen, friend and neighbor, Mr. Bailey has been held in high esteem by the people of North Scituate, Mass., where he has been moderator at the annual town meeting since 1899.

Mr. Bailey has already done much constructive thinking concerning his new work. He plans to bring the Art School into closer relations with the industries of the city by working thru committees representing the various industries. He hopes to accomplish much for the industries along the lines of design, and this is where art in America needs to be strengthened. The fine arts courses will be worked out in cooperation with the Western Reserve University, and the fine and industrial arts courses worked out with the Art Museum.

In his work at the Museum, he will endeavor to relate the Museum with the Art School and the public school art. In this work emphasis will be given to design as seen in famous paintings, textiles, and surface patterns. Mr. Bailey also has

in mind a series of docent leaflets each containing a half-tone of one of the pictures in the Museum and a statement of what to look for in the picture. These will sell for perhaps one cent each. By this means both children and parents will come to know every picture in the Museum and feel a personal interest in each.

We shall confidently look to Cleveland to show us how to make art a vital factor in the lives of all the people of a community.

DEAN CHARTERS GOES TO ILLINOIS

DR. W. W. Charters, has left his position as dean of the School of Education at the University of Missouri to become professor of the theory of teaching at the University of Illinois. He will devote much of his time to directing research work in education. At the University of Missouri he has always had a goodly number of graduate students in manual arts in education, and he gave them much special attention. It is believed that Dr. Charters' coming to Illinois will mean an added influence in behalf of the "activities" in education, which of course includes the manual arts.

The time is now here when educational work in the manual arts is out of the field of random effort. It is taking on some of the aspects of science. Men like Dr. Charters can assist greatly in training up men with knowledge of the scientists' method of attack.

Our manual arts literature, seemingly, is beginning to compare favorably with that of older lines; our teachers are beginning to take four years of college work; and a few are undertaking graduate work. It's a good sign, so long as graduate problems for manual arts men have to do with bettering manual arts teaching methods and giving a more scientific basis for practical methods of procedure.

OBSERVATIONS OF A TRAVELLER

THE Detroit Manual Training Club has a very fortunate practice of sending its president each year on a trip to visit schools and bring back to the Club all the new ideas he can pick up. Last year the president, L. G. Burgess, head of the manual training work at the Northwestern High School, visited Chicago, Milwaukee and Minneapolis. Thru A. M. Cornwell, we learn that his report contained the following statements:

One of the conclusions made is, that in order to do efficient production work, small classes are absolutely necessary. The time element must be subrogated to the educational factor in production work.

The first course in Mechanical Drawing should give a student a knowledge of how to read working drawings rather than how to make them. A boy just starting out to learn cabinet making is made to put the cart before the horse if he is required to design his project. He should be given a chance to make furniture of good design before being asked to design his own.

A student in a technical course learns processes rather than gains accurate mechanical skill. Well designed, simple projects, which require in the construction all the desired processes but only ordinary skill, are much better from an educational viewpoint than the more complex problems.

The name "Trade School," when given to an educational institution, is enough to kill attendance from the start. Boys will take up, with all their limitless enthusiasm, industrial and technical courses which give them the fundamentals of a trade but call such a course a trade course and they simply will not enroll.

A series of lesson sheets, giving in simple sentences a synopsis of the things each student is expected to learn at each lesson, is as desirable in our manual training shops and mechanical drawing rooms as it is in a course in political economy at a university.

All of the instructors agreed that if we can teach the boy 'judgment' or 'mechanical sense' or the ability to think about the thing he is doing, we do not need to worry over the facts the boy is expected to learn.

OPEN QUESTIONS¹

"There is more to be said on this subject."

PROPORTIONS OF JOINTS IN WOODWORKING.

Gentlemen,

Thru your next number of the *MANUAL TRAINING MAGAZINE* will you kindly advise me as to the proper sizes for mortises and tenons in joinery? I would appreciate very much if the information were given in the form of a table wherein the length, width, and thickness, of the tenon, and the length, width, depth, angle of cutting, etc., of the mortises were given in terms of the area of cross section, or dimensions of stock joined. This table of course would apply only to stock of the same kind, and allowance would have to be made for joining various different kinds of material together. If you do not care to publish this matter kindly refer me to some text wherein I may find what I am seeking. Kindly include the dowel butt joints in the above table.

Hoping to receive the desired information and thanking you in advance, I am,

Yours truly,

—L. J. EDMUNDS,

Marine City, Mich.

On receiving this letter we wrote to men whom we thought most likely to give a satisfactory answer. The results follow:

My dear Mr. Editor,

Your letter, inclosing one from a correspondent in re mortise-and-tenon joints, has been received.

In reply I will say that we have investigated the matter of relative proportions of tenons and mortises to quite an extent but have not been able to formulate rules and tables for the simple reason that we found as many instances of variations as there were cases to be dealt with.

It seems futile to endeavor to tabulate pro-

¹NOTE: Readers are cordially invited to send to the editor of this department, discussions of any points taken up in the department, and brief contributions on any topic interesting to teachers of shopwork.

portions when the governing factors are so variable. For example, the top rails for tables, etc., are nearly always fitted into the legs of the object with either one or two shoulders and in nearly all cases the mortise from either side meets the other in the center of the leg. In any case, unless the shoulders are made senselessly large, the tenon will be large enough to carry any weight which might be imposed upon the rail. Other things being equal, the racking strains are much more severe than simple strength requirements, and it is customary to make the tenon as wide as possible to withstand this strain.

The same reasoning should be applied to mortises and tenons in any position and as the various positions are legion, it has seemed impossible to formulate tables for the guidance of the inexperienced. We have worked out some experiments with the holding power of tenons of various depths and found results very inconcordant, except that in general the greater the depth, the more resistance to pull; but no definite ratio was discovered. As the depth of mortises is limited in nearly all cases by the structural elements of the design, we did not pursue the subject further because of the variables. Your correspondent may get some light on the subject by reading an article in one of the recent numbers of the *Industrial Arts Magazine*¹ on this matter.

I am sorry not to be able to offer you more definite information.

Very sincerely,

H. W. SCHMIDT,

State Normal School, Oshkosh, Wis

A letter was received from Ira S. Griffith of the University of Missouri in which he referred to an article in the *MANUAL TRAINING MAGAZINE*, published in March, 1915, entitled, "Proportioning Glued Joints for Strength." This was written by Frederick H. Evans, dean of the College of Industrial Arts,

¹January, 1917. "Dowel Versus Mortise-and-Tenon Joint," by Hans Schmidt.

Toledo University, but at that time a member of the faculty at Bradley Institute. This article described and illustrated tests verifying the formula which states that the thickness of the tenon should be one-half the thickness of the stile when the width of the stile and of the rail is five times its thickness.

Mr. Griffith also called attention to Section 225 in his book, *Woodwork for Secondary Schools*. In this section he says that in actual practice mechanics do not strive for theoretical nicety, "but rather elect to use certain standard sizes; determined in no small part by the tool equipment."

Robert W. Selvidge, professor of industrial arts at the George Peabody College for Teachers, writes as follows:

I have been thinking a little about the question which we were discussing concerning the relative sizes of the mortise and tenon with respect to the members. I find that Kidder has the following to say on that subject:

"The tenons should have a thickness from one-fourth to one-third that of the frame, and the frame, and the breadth should be about two-thirds of the breadth of the piece, but no single tenon should be more than 4 inches wide, as a broad tenon may shrink considerably and become loose, besides necessitating a wide mortise, which might weaken the frame. Hence when the wood is wide, say over 7 inches, a double tenon should be used."

This is not a very definite rule, but it probably contains some of the elements of a set rule. I am still of the opinion, however, that conditions vary so much that it would be impossible to give a rule except one with very broad limits.

The Editors hope there will be further contributions on this time-honored subject. If any teacher has a satisfactory rule or formula, or if anyone has worked out a table of sizes based upon actual practice, he will be contributing to the profession by sending it for publication.

THINKS THE NIB CAME FROM EGYPT.

My dear Mr. Editor:

For the past few months I have been very interested in your "Open Questions" department. I have taken especial interest in the letters on that "little nib on the saw." I have hoped some one would offer the solution that was given to me a number of years ago by my



father when I asked the question "Why is that nib on the saw?"

My father was a student as well as a skilled workman. I have always felt that he had some source book or some historical foundation for his solution. I have studied but do not find an authority except my father. However, his solution follows:

"Ages ago the Egyptians found it necessary to reinforce their hands by the invention of tools and they made very crude saws. The saws were made with a hooked or curved knife on top of the blade. This hook was used to pull bark from the log and the sharp part was used as a knife to cut small twigs. As saws became improved, this hook-knife persisted as a vestigial trace of the primitive tool in the nib of our saw."

N. B. The attached sketch will give you an idea of the drawing he made to illustrate this to me.

—FRANK H. SHEPHERD,
Associate Professor of Industrial Education,
Oregon Agricultural College, Corvallis, Ore.

To Editor of "Open Questions,"

I am trying to teach lettering to my seventh and eighth grade classes in mechanical drawing, and I am much puzzled to know whether I ought to teach vertical letters or sloping letters. I notice that many books give both, but they do not tell which to teach in the grammar grades, and I do not have time to teach both.

Which should I teach? and why?

—L. F.

Who will answer Mr. F.?

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

This department exists solely for the mutual exchange of ideas, drawings and photographs of projects, methods and shop kinks of successful teachers.

The efficient man is a producer. He grows by what the successes and failures of his work teach him, and what he does as a result of his experience. Such men are represented in this issue. Your chance is next.—Editor.

BANDAGE WINDER FOR RED CROSS WORK.

THE bandage winder shown in the accompanying drawing was worked out by the class in sheet-metalworking at the Oswego State Normal School for use about the school and by the local Red Cross Society. In the first order twenty-two were made by the students. The popularity of this winder is growing fast and orders are in now for several dozen for use in nearby towns by other Red Cross chapters. The simplicity of construction and the processes involved make it a very suitable project for a seventh or eighth grade class in the sheet-metal shop. The amount of material used is slight. The crank is ground flat on one side to facilitate the beginning of the winding operation. It is made of $\frac{1}{2}$ " rod, 12" long. The washer is soldered in place after the rod has been bent and ground flat. The base is made of oak, the balance of the winder is made of 24 gauge galvanized iron finished with aluminum paint.

When in use the bandage winder is clamped to a table with a small carriage-maker's clamp.

—J. C. PARK.

A SANDING DRUM FOR THE HIGH SCHOOL SHOP.

In the smaller high school manual training departments, it may not be desirable nor advisable to install an expensive sanding machine, and yet the need of some contrivance, to facilitate the finishing processes on wood, is a decided one. Such a contrivance, if easily made and convenient to use, lends interest, and produces a greater incentive among the students to take particular pains in getting a good smooth surface on their work.

The attachment for a wood-turning lathe, which is described below, may prove of value to the small shop. It is not expected to replace nor to be a substitute for the commercial sanding machine where such a machine is a necessity.

The machine consists of a cylinder of pine, 18" long and $3\frac{1}{2}$ " in diameter. The cylinder is fastened to the face-plate and carries the sandpaper which is held in place by the clamping action of a wedge-shaped piece of pine or oak, fitting into a groove in the cylinder. The clamping piece is fastened with wood screws.



The table of the machine is made of four pieces. The bottom, which may be of pine ($\frac{1}{2}$ " x $9\frac{1}{2}$ " x 16"), is grooved to fit the ways of the lathe, care being taken to see that the grooves are so placed that the table will be centrally located in relation to the lathe centers. The back ($\frac{1}{2}$ " x 7" x 16"), is fastened to the bottom with wood screws. The top consists of two boards, preferably of hard wood ($\frac{1}{2}$ " x $4\frac{1}{4}$ " x 16"), which are held in place by two pieces of round wrought iron forged into a semicircle. The ends are bent at right angles to the semicircular part and flattened so as to give surface upon which to fasten the top boards. When the boards and the forged iron semicircles are fastened together in the proper relation as shown in the drawings, all are attached to the back board by two small ($1\frac{1}{4}$ " x $1\frac{1}{4}$ ") hinges, so that the amount of "bite" of the sandpaper may be controlled. Two forged iron uprights support the top of the table at the front. These uprights are slotted at the lower end to allow of a vertical movement. A round head wood screw with washers for each upright provide sufficient holding power against the bottom board to prevent any vibration of the top.

The complete table is held in place on the lathe bed by the regular tool rest clamping mechanism. A sheet iron plate $3\frac{1}{2} \times 6$ " is attached to the bottom board with wood screws and has a hole thru the center to accommodate the clamping bolt of the tool rest.

When using the machine the lathe should be run on high speed and the wood passed over the cylinder, slowly. You will find that this device will also economize sandpaper for there will not be the tendency to throw the paper away as soon as it loses its sharpest cutting edge, as is the case when "Johnny Armstrong" has to do the work.

—F. C. SCHMELZ.

Granite County High School, Phillipsburg,
Montana.

JUMPING STANDARD.

Boys are always interested in equipment relating to athletics. The standard shown in the

accompanying drawing is simple in construction, yet very serviceable for either indoor or outdoor use. The length of the upright should be increased the desired amount if the standard is to be used for pole vaulting.

TURNING SAW.

A piece of equipment frequently in need of repairs in the elementary shop is the turning saw. The drawing indicates one solution of the problem by having the pupils make new frames. The cross piece A is made to fit somewhat loosely. Its length will be determined by the length of the saw block to be used. The tightening agent may be the wing nut and threaded rod as shown, or a twisted rope. In the latter case the arms are shaped as shown. The handle may be made any desired length.

—A. J. METLER,

Brookline School, Pittsburgh, Pa.

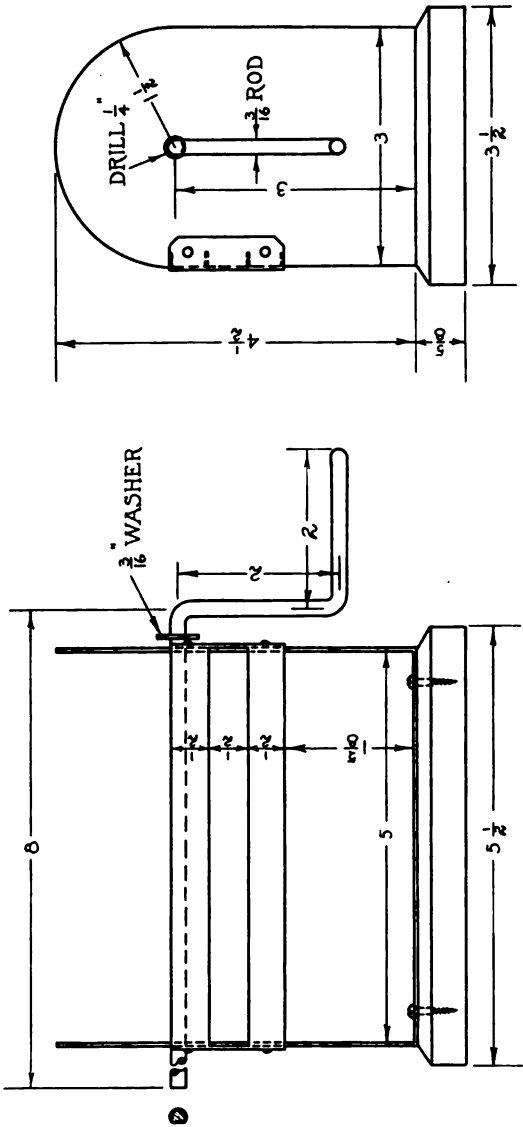


SANDING DRUM FROM BELOW.

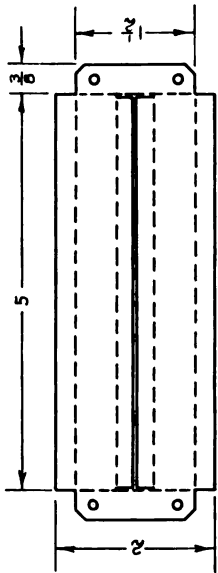
THE MECHANIC.

Workman, artisan and dreamer,
His to puzzle and to plan;
Toiler, prophet, thinker, schemer,
For the betterment of man;
Through the turmoil and the panic,
Through the smoke and grime and murk,
Looms the calm and wise mechanic,
Master of the world of work!
From *The American Machinist*.

BANDAGE WINDER

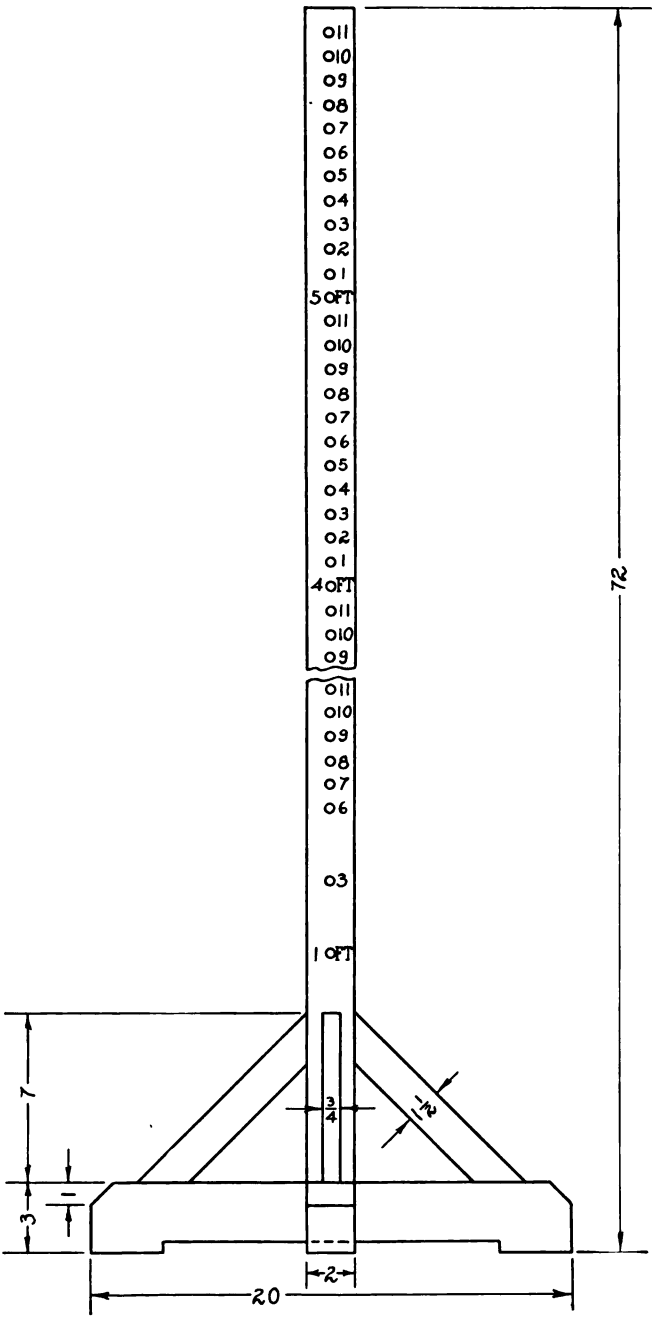


MATERIAL -24 GAGE GALVANIZED
IRON
FOLD CLOTH-GUIDE ON DOTTED
LINES

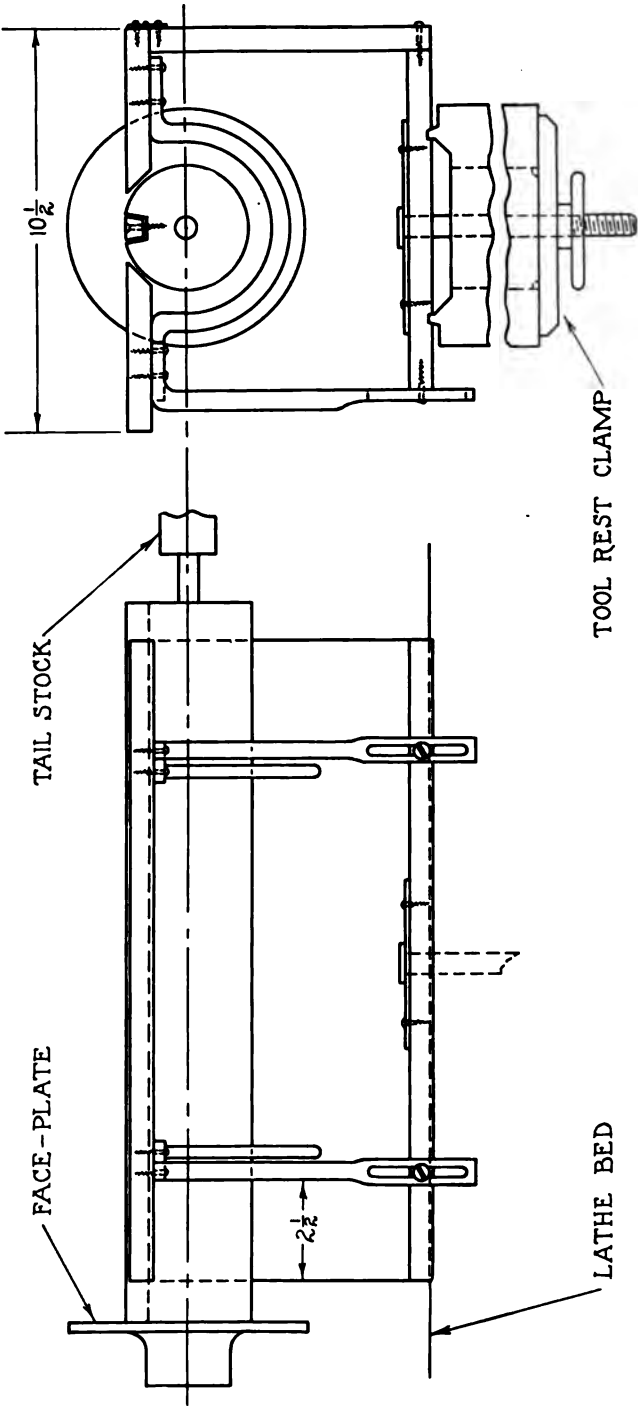


DETAIL OF CLOTH-GUIDE

JUMPING STANDARD



SANDING DRUM
ASSEMBLY



SANDING DRUM

DETAILS

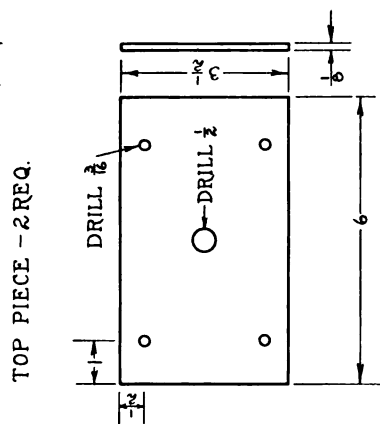
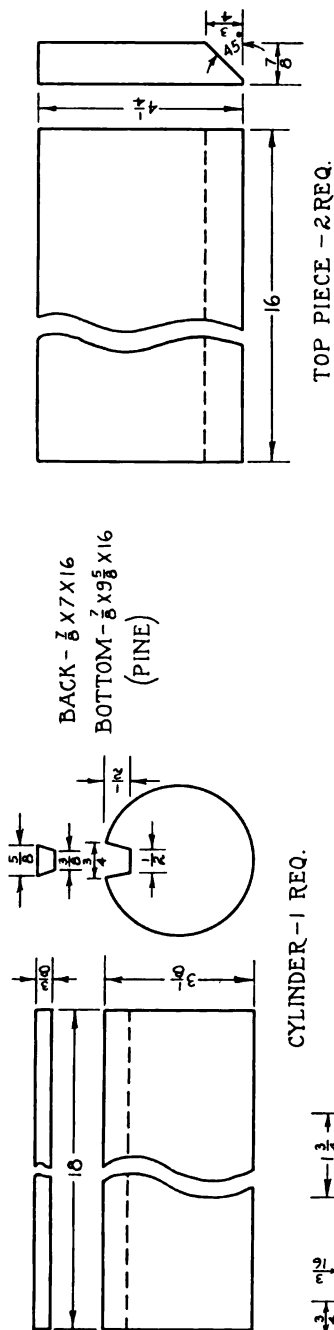
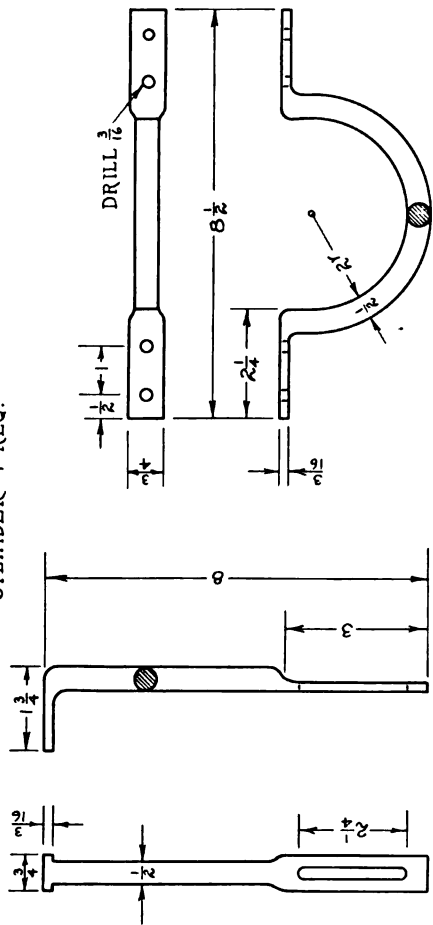


PLATE - 1 REQ.

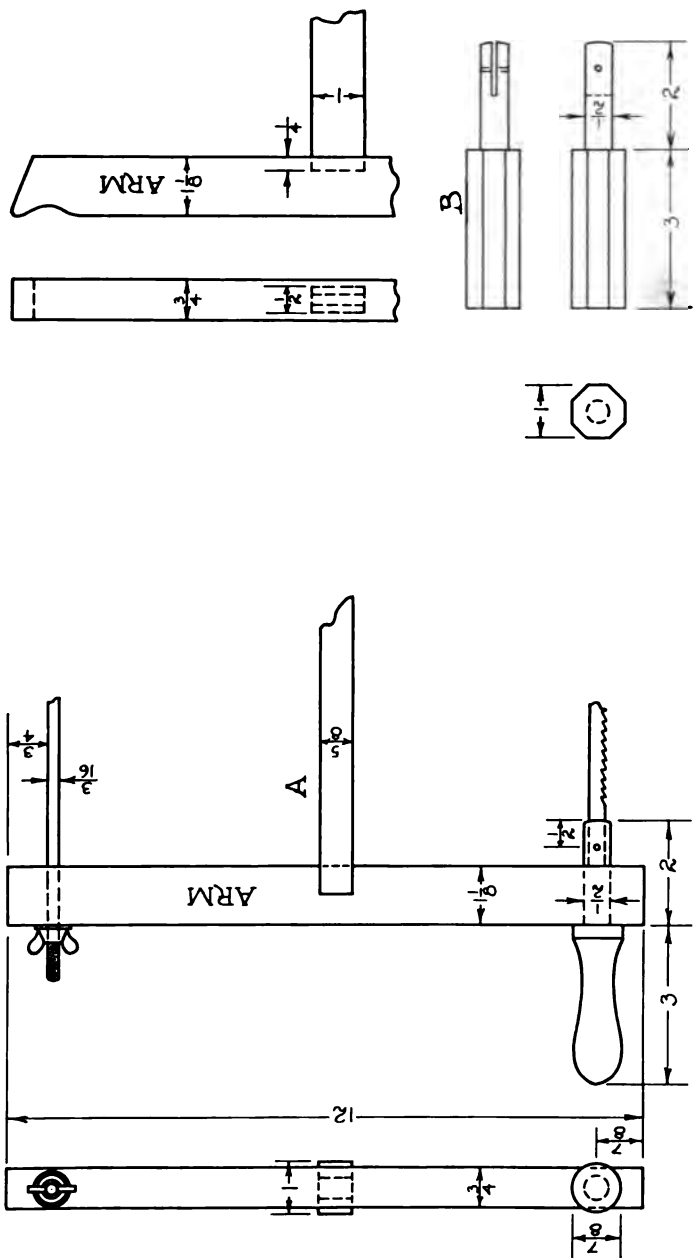
CYLINDER - 1 REQ.



SEMICIRCULAR TOP PIECE - 2 REQ.

UPRIGHT - 2 REQ.

TURNING SAW



CURRENT PUBLICATIONS

Elementary Social Science, by Frank M. Leavitt, associate professor of industrial education at the University of Chicago, and Edith Brown, instructor in the prevocational department of the Lane Technical High School, Chicago. Published by The Macmillan Co., New York, 1917. 5 x 7½ in.; 142 pages; price, 80 cents.

This is the initial book in a new field. It is the first book to bring the elementary facts of social science together, and present them in practical form for boys of the intermediate school period of development. It takes the every-day subjects of land, labor, capital, management and business, also poverty, education, ignorance, disease and crime, and presents them in a way that is interesting to boys—far more interesting than many of the “dead” subjects that are presented to them, and leads them on toward an understanding of some of the biggest problems this nation, and the whole world, has to face and solve in the future.

Read the book yourself, and you will recommend it.

Illustrative Handwork for Elementary School Subjects, by Ella Victoria Dobbs, assistant professor of manual art, University of Wisconsin. The Macmillan Company, New York, 1917. 5 x 7½ in.; 223 pages; price, \$1.10.

Again Miss Dobbs has given us an admirable book on elementary handwork, one that ought to help to evaporate the cloud of mist that still hangs over this section of the manual arts field. She has frankly accepted the point of view that handwork in the elementary school should function both as subject and as method. She says, “it is not only a subject to be studied for its own sake, but may be a helpful method of studying other subjects.” She accepts this dual purpose and then states definitely that the present book serves only one of them—handwork as a method of teaching other subjects. She says that both types of work are essential in a well rounded course of study, but cannot be taught by the same method nor at the same time. Then she proceeds to prove that handwork can be used profitably (1) as a method of study, and (2) as a method of recitation, and (3) that it is practical under ordinary school conditions.

It seems to us that her propositions are fun-

damental and her point of view correct, and that the large number of suggested lines of procedure will be invaluable to any grade teacher who has the modern spirit.

The Practical Book of Architecture, by C Matlack Price. Published by J. B. Lippincott Co., Philadelphia, 1916. 6½ x 8½ in.; 348 pages, 255 illustrations; price, \$6.00, net.

This book has two very practical purposes: First, to give one who reads it the ability to distinguish between the principal styles of architecture; second, to give him the information of a practical sort that he needs if he is going to employ an architect to design and superintend the building of a home or any other structure that can come under the term architecture. The chapter on the “Architect and Client” is an especially valuable collection of items of advice that has never before been presented in such readable form.

Fundamentally the purpose of the book is not technical instruction, tho it deals constantly with technical terms; its fundamental aim is to present those facts concerning architecture, both historic and technical, which every well-informed man or woman should know as a matter of culture and for practical use.

The book is a fine example of the printer's art.

Agricultural Woodworking, by Louis M. Roehl, director of farm mechanics at the Milwaukee County School of Agriculture and Domestic Economy, Wauwatosa, Wis. Published by the Bruce Publishing Co., Milwaukee, Wis. 6¼ x 9¼ in.; 137 pages; price, \$1.00.

This book is a well-selected collection of problems especially suited to the needs in consolidated rural and agricultural high schools, or whatever the products of the workshop are to be employed on the farm. Each problem is presented by means of a good working drawing, a list of material, stock bill, working directions, and in many cases, a perspective view or a photograph of the finished object, or both. In the front part of the book there are several illustrations showing the correct handling of the fundamental tools, and in the back of the book are illustrations of belt-lacings, knots, hitches and splices. The book is attractive in make-up.

Development of Design through Paper Cutting, by Esther W. Wuest, director of art instruction, public schools, Portland, Oregon. 8½ x 11 in.; 36 pages; paper covers; published by the author.

This book contains illustrations of most delightful children's work in paper cutting. Miss Wuest has made school paper cutting a fine art, and has made the children artists to a very unusual degree. The book briefly describes the materials and methods she employs in giving instruction.

How to Make High-Pressure Transformers, by F. E. Austin, professor of electrical engineering, Dartmouth College, Hanover, N. H. Published by the author. 4½ x 7 in.; 46 pages; price, 65 cents. Second edition of a book published in 1914.

Preliminary Mathematics, by F. E. Austin, professor of electrical engineering, Dartmouth College, Hanover, N. H. 4¾ x 7½ in.; 174 pages; price, \$1.20. Published by the author.

The purpose of this book is to provide a satisfactory text-book for junior high schools—one that will make a real connecting link between arithmetic and algebra. It shows how to solve problems.

RECEIVED.

Continuation and Part-time Cooperative Classes. One section of the annual report of the superintendent of public schools, New York City, for the year 1915-16. Contains much interesting data on this new work in New York City.

Prevocational Training in Elementary Schools, by William L. Ettinger. One section of the annual report of the superintendent of public schools, New York City, for the year 1915-16. A valuable report. Contains many practical details as well as a statement of the theory underlying the organization of the work.

Concrete Ships. A Possible Solution of the Shipping Problem. An interesting, illustrated 36-page pamphlet published by the Portland Cement Association, 111 West Washington St., Chicago. Shows concrete boats, big and little—in France, in England, in Germany, in Australia, in Canada, in the United States. A fine pamphlet for boys to get hold of. Why not send for a copy before you forget it?

Bulletin of the Illinois Manual Arts Association. This is the first of a series of quarter-

ly bulletins to be sent out by this association. The bulletin is edited by C. V. Denham, High School, Decatur, Ill. This first number (May) gives special attention to junior high schools.

Proceedings of the Indianapolis Meeting, National Society for the Promotion of Industrial Education. A report of 312 pages, sent out from the Society's headquarters at 140 W. 42nd St., New York City.

The Intermediate School Situation in Oakland, California. Part II of "A General Report" by the superintendent of schools, A. C. Barker. It discusses the introduction of departmental instruction into the upper grades of the elementary schools, variations from the standard departmentalized school and then states conclusions and makes recommendations.

The Illinois Survey, L. D. Coffman, director. A cooperative investigation of school conditions and school efficiency initiated and conducted by the teachers of Illinois. George A. Brown, publisher, Bloomington, Ill. Price, \$1.00.

Industrial Education Course, Oshkosh State Normal School, Oshkosh, Wis. This is a very effective statement of the course offered in this school to prospective teachers of the manual arts.

Service Instruction of American Corporations, by Leonhard Felix Field, assistant chief examiner, Municipal Civil Service Commission, New York. U. S. Bulletin No. 4, 1916. Bureau of Education, Washington, D. C.

Home Canning by the Cold Pack Method, by Naomi O. Newman. Extension Circular No. 10 issued by the College of Agriculture of the University of Illinois, Urbana, Ill.

Vocational Education, Holyoke, Mass. The third annual report of day school for boys, evening trade extension courses for men, and evening practical arts classes for women. William H. Whitney, director.

Work of School Children During Out-of-School Hours, by C. D. Jarvis. Bulletin No. 20, 1917, issued by the U. S. Bureau of Education, Washington, D. C.

Forestry and Lumbering. List of slides and photographs issued by the Division of Visual Instruction, State Education Department, Albany, N. Y. A 16-page bulletin.

MANUAL TRAINING MAGAZINE

OCTOBER, 1917

WAR WORK OF THE LONDON SCHOOLS

SIR ROBERT BLAIR,

Education Officer of the London County Council.

Last May Dr. William H. Maxwell, superintendent of public schools in New York City, in the course of correspondence with Sir Robert Blair who is similarly connected with the schools of the city of London, England, received a letter giving a comprehensive statement of the changes that have taken place in the schools of London on account of the war. Thru the courtesy of Dr. Maxwell we are permitted to print such parts of this letter as seem to be of special interest to readers of this Magazine—Editors.

AT the outbreak of war, in the early days of August, 1914, it was at once decided to re-open the public elementary schools in London, and this was done a fortnight earlier than usual.

Within almost a few weeks of the outbreak of war many schools had, on their own initiative, started organizations for the provision of comforts for the soldiers—socks, mufflers and all that kind of thing for the winter campaign. These efforts gradually spread until I should think every school had an organization which was keeping up communication with old boys, and making some provision of comforts for them of one kind or another. It was only when, towards the end of the first year of the war, we began to organize efforts to provide clothing and other kit necessities for Belgian and Serbian children, that we learned how widespread was the earlier organization of making provision for the comfort of old boys. I should like to say here that this effort to provide comforts for old boys has done more to foster a school *esprit de*

corps than anything that has probably happened in the history of municipal schools since their origin in 1870.

TRAINING SOLDIERS TO COOK.

One of the most important efforts for private soldiers was made however in the summer recess of 1915, when 264 of the domestic economy organizing staff volunteered to forfeit part of their holidays in order to help in the work of training 2,500 soldiers to cook the ordinary requirements of the private in the field. The War Office drew men from different units from pretty well all over England, brought them to London in two great groups of 1,000 to 1,500 each and paid 1s 9d. a day for the up-keep of the men. The soldiers were billeted in the school buildings, and the preparation of their food formed the basis of the cookery instruction. Each group was taken for a period of ten days. The social welfare of the men during their sojourn in London was provided for by various local associations in cooperation with the managers

and head masters. At the close of the period of training the War Office was most appreciative of the work done by the domestic economy instructresses. They did not however ask for this to be repeated in the summer of 1916 nor in 1917, although the instruction was repeated to some extent in certain other parts of England. The War Office has however returned to us in another form by asking us to lend them 30 selected domestic economy instructresses for the purpose of visiting army canteens and giving advice both on cooking and (what I believe is more important) on quantities used. I have not the slightest doubt that our domestic economy instructresses will be of great use in this respect.

WOMEN TRAINED TO DO MEN'S WORK.

As first volunteering, and afterwards the call under the Military Service Act, took away men from all kinds of occupations, efforts were made to train women to take their places. To a very large extent the women learned how to do things by undertaking them, but in certain cases they were glad of opportunities for attending training classes. Our organization provided training classes for women for clerical occupations, for railways, for banks, for shipping offices, and so on. Our operations lasted for but a short time. The need was so great that it had to be met immediately either by trained workers or by untrained. In the few short months that we organized these training classes something like 1,500 women were trained chiefly for clerical occupations, but in some cases for leather working, to take the place of grocers, boot-makers, and so on.

MAKING SHELL GAGES.

I come now to what will probably have the greatest interest for you, the immediate ways in which the school organization was able to help the army organization.

As you are probably aware, the universities in England have for some years had an officers' training corps. These, of course, were increased enormously to meet the demand for officers. You are, I am sure, further aware that the secondary schools in this country had many of them formed junior training corps in which the older boys went through a period of training and afterwards joined on to the O. T. C. All these were straight away expanded.

But most of all, our technical institutions have been helping in the way most appropriate to them. A number of them, in quite the early days, formed connections with government arsenals and got various kinds of munitions to make, but at the time that the Ministry of Munitions was established, July, 1915, a Metropolitan Munitions Committee was organized. The Minister of Munitions asked me to become a member of the Metropolitan Munitions Committee, mainly with the object of bringing in all the help that could be obtained from the technical institutes. The immediate demand of the Ministry of Munitions was for gages for shell-making, mostly inspection gages, some workshop gages. At that time almost all manufacturing was held up for want of the essential inspection gages. Our technical institutes were at first very diffident about undertaking this work, the standard of skill required being so high, but after a few appeals on the ground that here was the chance of a century for technical education, the institutions got to work, and there are something like a dozen technical institutions now employing a staff of 210 men working at the manufacture of gages. These men were partly metalworkers in the workshops of the technical institutes, partly metalworkers who had been employed in the manual training shops of our elementary schools, and partly woodworkers similarly employed. At each institution a little organization with one or

two highly skilled men, assisted by a number of less skilled, was got together, the machines were "tuned up," and in a short time the manufacture of gages began. As time went on we found that we wanted higher class machines, that new methods of manufacture could be adopted, and new methods of testing the gages had to be invented. In my opinion the technical institutes never undertook better work. They have in this way not only done a great national service, but they have, which is of the utmost importance to their future, acquired the confidence of the manufacturer. We have turned out approximately 50,000 inspection gages, and when your experts tell you the dimensions of these you will probably agree with me that the technical schools have done in this respect a splendid piece of work.

TRAINING WORKERS FOR MUNITION FACTORIES.

I shall return to other productive work in technical institutes in a moment or two. Meanwhile let me now say that, in addition to manufacture, it was necessary to train semi-skilled workers for the munition factories. At first we gathered together all the metalworking apparatus in our elementary schools and placed that in two of our technical institutes, not engineering or metalworking institutions. Shafting was put up, power was installed, and the lathes got to work and have been running ever since July, 1915, for twelve hours a day in three periods of four hours each. There is a staff of 96 men. At first the period of training was for one period a day on six days a week for six weeks, in all 144 hours. By and by, to meet the demands of manufacturers, we took on the training of more highly skilled turners, of setters up of machines—capstan lathes, milling machines and so on,— the training of women for tracing in drawing offices and subsequently for mechanical

drawing, training of lead burners for employment in explosive factories, and training of gage makers for employment in tool rooms of national and other shell factories (these men have mostly been drawn from the jewelry and silversmithing trades). The more skilled the training we gave, the longer the training took, and so the numbers produced weekly have diminished, but in the two years we have trained, certificated and placed 6,000 workers, the larger part of the later numbers being women.

While this was being done in these two institutions hundreds of others were being trained in two or three other institutions, the total trained in the institutions other than the two probably reaching 2,000.

SCHOOLS HAVE GAINED THE CONFIDENCE OF THE MANUFACTURERS.

Let me say here that unless the staff had made it their business to get orders for semi-skilled workers from the manufacturers, we should have closed our training shops long ago. Both the manufacturing and training shops are at this day still hard at work and their weekly output is at the maximum. You will readily be aware that in the earliest days of this kind of work the manufacturer was indisposed to believe that trade, and particularly such trades as engineering, had anything to learn from the technical schools. I have had conferences with manufacturers and have heard about things being "academically right and practically wrong." The upshot of it all is that we have obtained I think I might say the complete confidence of the manufacturers.

I am glad to say that, in connection with gage making and training of munition workers, the Council had on its organizing staff an engineer and he has been able to give the most valuable service as works manager.

Apart from the gage making, of which

I have given you some account, and the training of munition workers to which I have just referred, I must mention the work of a few institutions which, owing to the special objects of the institution, the qualifications of the staff and the apparatus at their disposal, was more or less of a specialized character. Institution A has done a great deal of work in training over 1,000 men belonging to the Royal Field Artillery, Royal Engineers and the Army Service Corps in cold shoeing. This institute has also been used for the reception, inspection and dispatch of many of the horse shoes required by the army. At another institution over 3,500 students were trained for Red Cross work. At this same institution a great work has been done in recruiting men for the skilled sections of the Royal Flying Corps. In this way 16,000 recruits were obtained and men have been trained for tinsmith

and coppersmith working and in connection with wireless telegraphy.

A third institution took on the general direction of the preparation of synthetic drugs in the chemical departments of the technical institutes, and the medical organization of the army was largely indebted to these chemical departments for the production of the much needed drugs.

There is a variety of other ways in which the highly expert skill of the staff of the technical institutes has been of service to the War Office, the Admiralty and the Ministry of Munitions. The staff have assisted as members of advisory boards or as actual directors of work to be carried thru. Even in a minor way a good deal of work has been accomplished in connection with optical instruments and generally with the manufacture of all kinds of munitions.

THE DEERFIELD-SHIELDS TOWNSHIP HIGH SCHOOL.

ROBERT W. SCHNEIDER.

Director of Industrial Arts, Highland Park, Illinois.

THE Deerfield-Shields Township High School is one of the largest of that type in the state of Illinois. It is located at Highland Park, a suburb, to the north of Chicago.

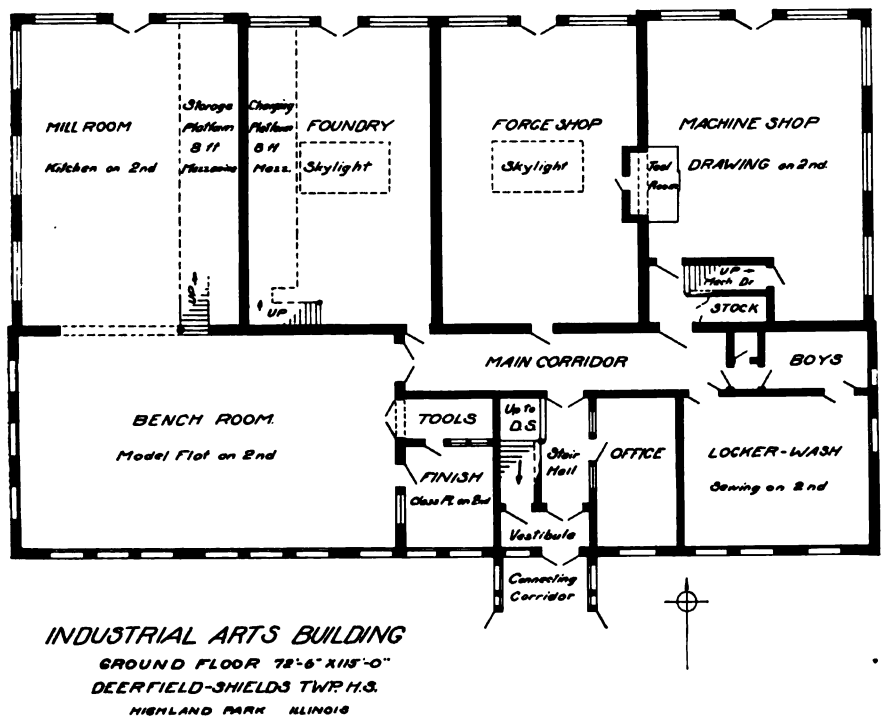
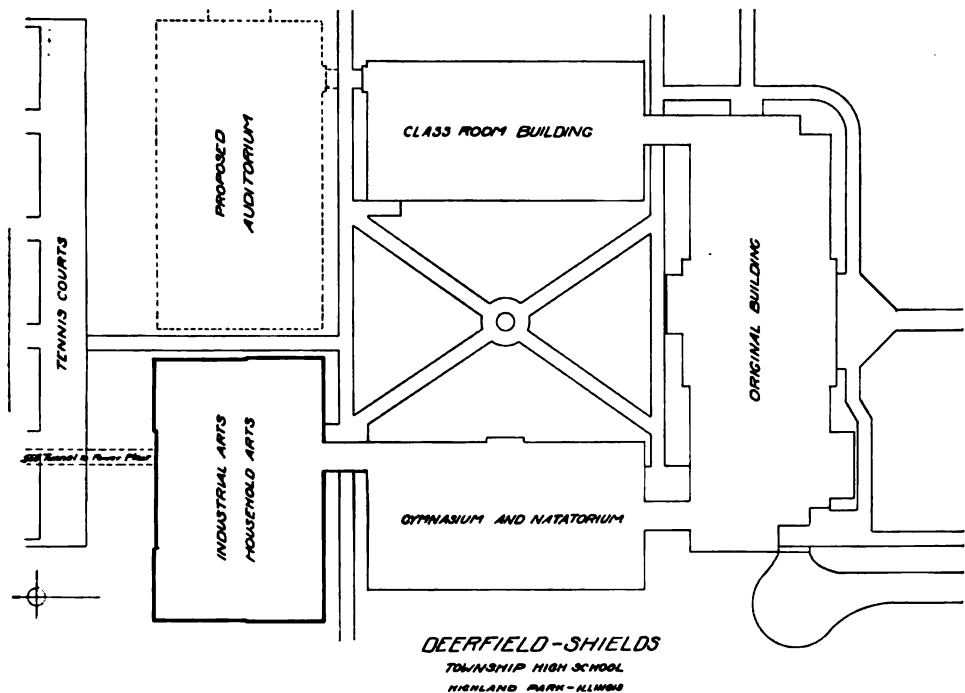
The industrial arts department of this school is housed in an entirely new building, 72'-6"x115'-0", two stories high, and of fireproof construction thruout. It covers a space of about 8400 sq. ft. It contains, besides the necessary shops, an office, locker and wash room, boys room and a small corridor on the first or ground floor, and the mechanical drawing room and domestic science department on the second floor.

The shops are all on the ground floor, there being no basement. They are high and airy, have light from two or more sides or from one side and a skylight, and

are heated by both steam radiators and a hot air system, thus insuring a sufficiency of both heat and fresh air during any kind of weather.

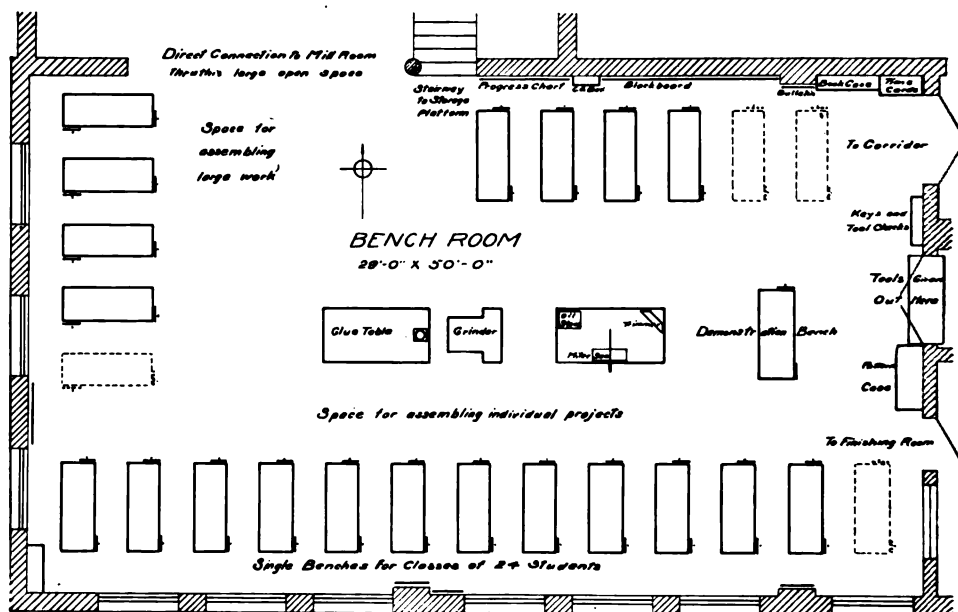
All machines are new, are set on solid concrete foundations, and are driven by individual D. C. motors operated by automatic starters with push button control, and are guarded as fully as possible. Power for these is furnished by the private power plant of the school, housed in a separate building 300 ft. removed from the remainder of the group.

Naturally, the woodworking department has the two largest and best rooms for its use, for practically all boys in the school take at least one semester of work here. This department alone occupies 3170 sq. ft. and includes a bench room, mill room, tool room, finishing room, and





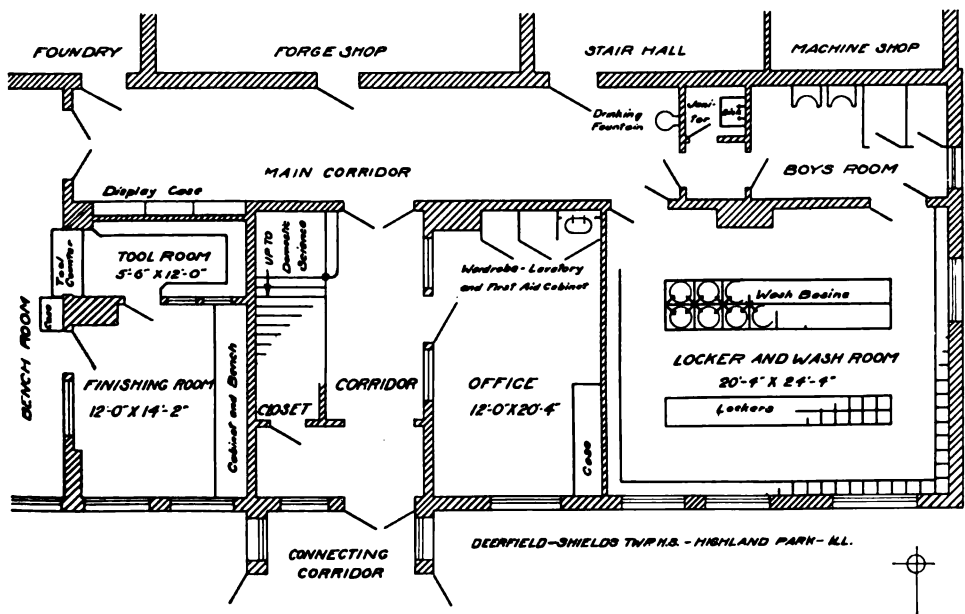
BENCH ROOM.



DEERFIELD-SHIELDS TWP. N.E. - HIGHLAND PARK, ILL.



TOOL ROOM.



a large space for storage of student's work. It will accommodate classes of twenty with one instructor, while with two instructors as many as thirty-six can be placed at one time.

The bench room is equipped with twenty single benches, each with front and tail vise, and with eight drawers for as many different students. These benches are arranged along three sides of the room, leaving the large space in the center for the assembling of students' work and group projects. In the very center of the room are found a glue table with space for clamps below, a table for trimmer, oilstones and miter-saw, with space for storing short scraps of lumber below, and between these two an oilstone grinder.

The fourth side of the room opens into the tool room, finishing room and corridor. The finishing room is separated from the shop by a glass partition, consequently it can be kept free from dust. It contains cabinets for storing supplies and spaces for students' work which is being finished.

The tool room contains all the tools for the department. In other words, no tools are found on or in the benches, or on any panels or in cases about the shop. Tools are given out only to students, by one of their number, for checks—a tool for each check. Thus all loss and breakage can be promptly discovered at the end of the period when all tools must be returned.

A large space for storing students' unfinished work is located on the mezzanine floor of the mill room, below which are the lumber racks.

The mill room proper is connected with the bench room by a large opening, making the two practically one room of an L shape. It contains, beside the lumber racks below the mezzanine floor, a universal table saw, band-saw, jointer, hollow chisel mortiser, circular saw grinder, six under-drive lathes, and a motor-head lathe

for larger work. A shavings exhaust system under the floor is arranged to take care of all refuse by removing it to the boiler plant. Spaces are left for various other machines, and electrical connections and shavings exhaust outlets were provided for these when the building was built.

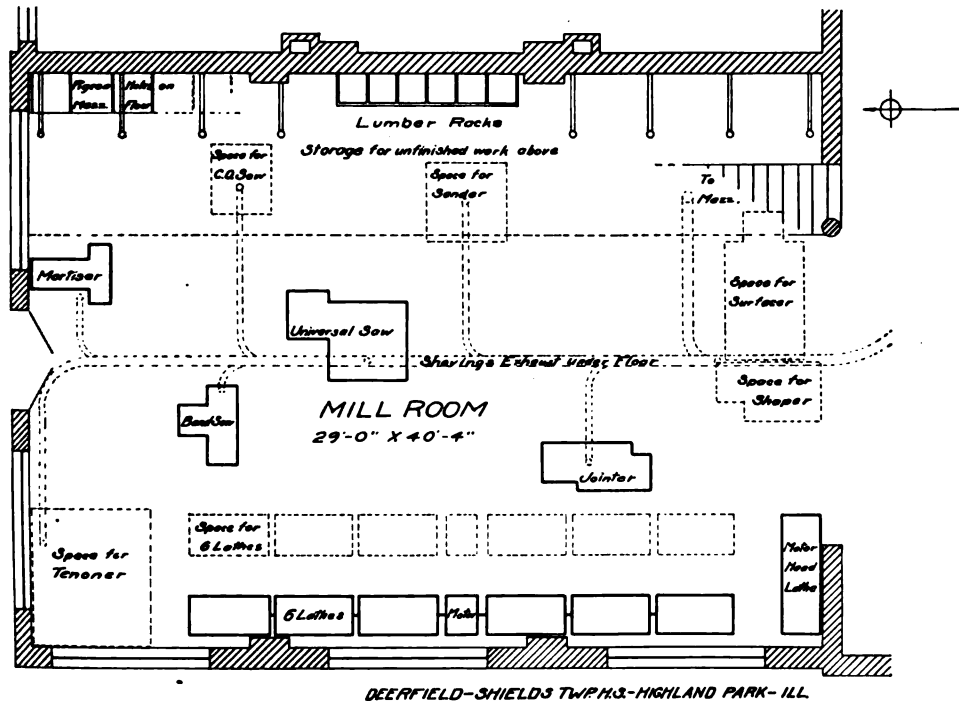
The work offered in this department includes elementary woodwork, furniture making, pattern-making, carpentry apprentice work, and special courses for night school classes. All students also work on group projects for the school, and during the past few years have built twenty-five drawing tables, fourteen biology tables, two cadet scaling walls, gun racks for the two military companies, diving platforms for the swimming pool, screens for the cafeteria and domestic science department, twenty-eight typewriter tables for the commercial department, and are now building forty hurdles for the athletic field, and a number of glass-front bulletin boards for the various buildings.

The foundry is located in a room, 25'x-40', with north exposure. It has large steel sash and a large skylight over head. It is equipped with an 18" Lewis tilting cupola furnace, brass furnace, tumbling mill, core oven, core machine and bench, brass trough, gyratory riddle, and twelve molding benches, and it will accommodate from twelve to eighteen students. The flask equipment consists of wood snap-flasks of several sizes, two and three part, and an assortment of steel flasks for floor work.

A six foot rim of concrete floor extends around the room except under the cupola itself, and all work excepting floor molding is done on this. The central part of the floor is covered with wood blocks and on this the pouring off is done. A charging and storing platform 7' wide extends along one side of the foundry and on this

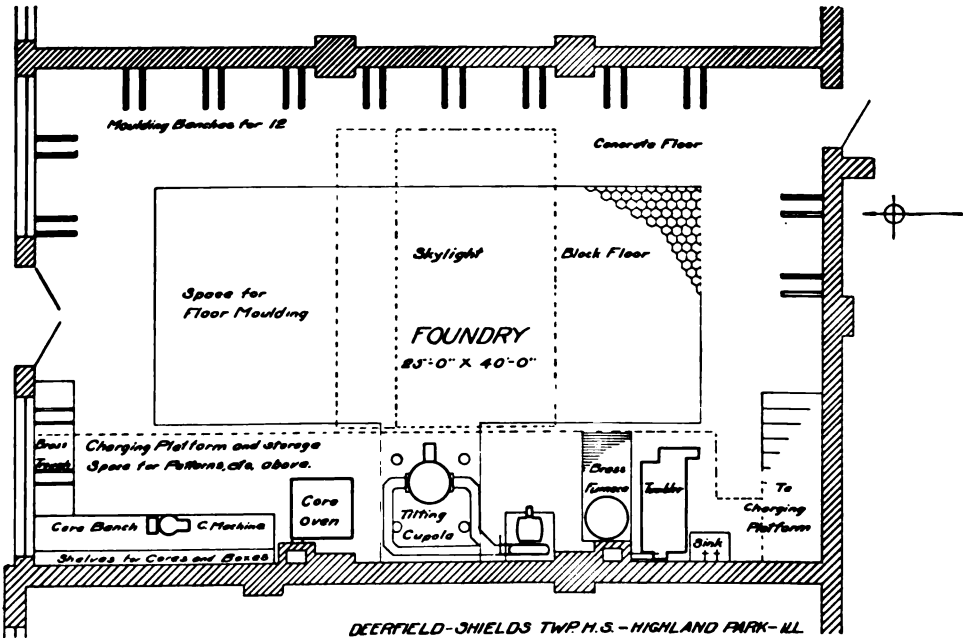


MILL ROOM.



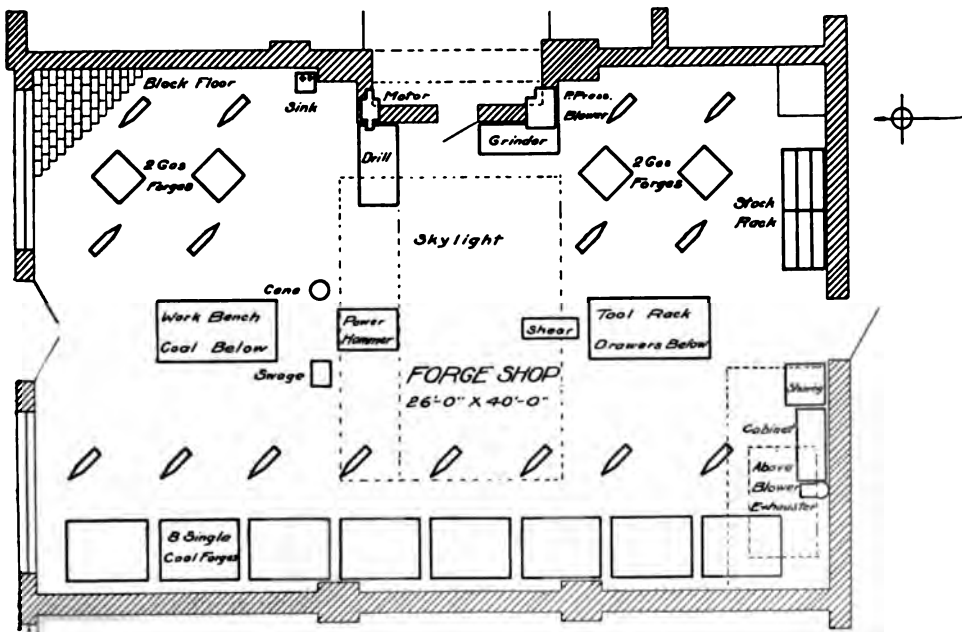


FOUNDRY.





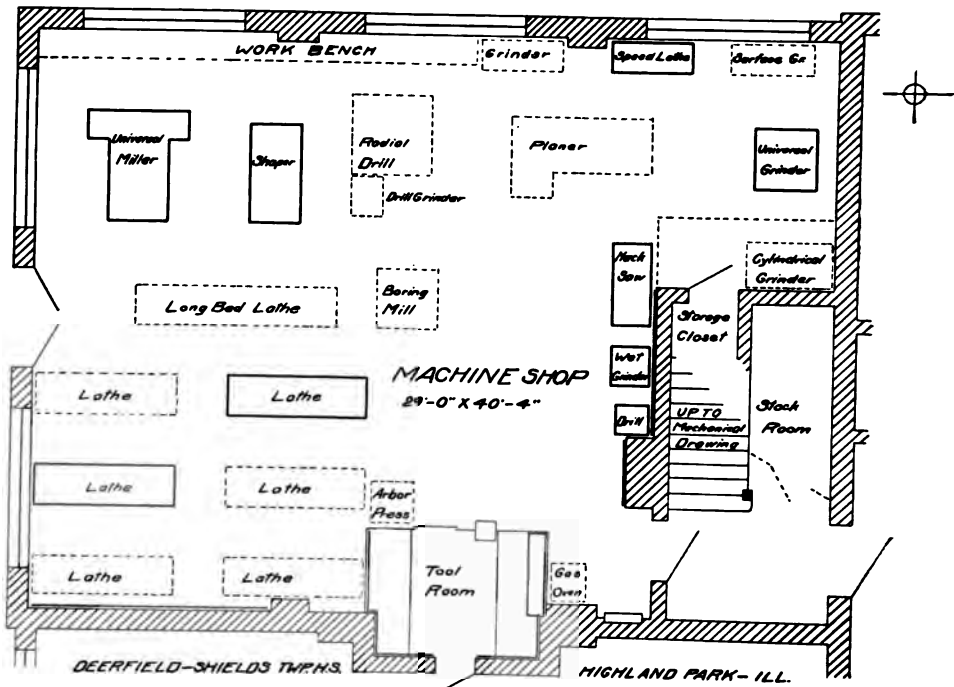
FORGE SHOP.



DEERFIELD-SHIELDS TWP.H.S.-HIGHLAND PARK-ILL.

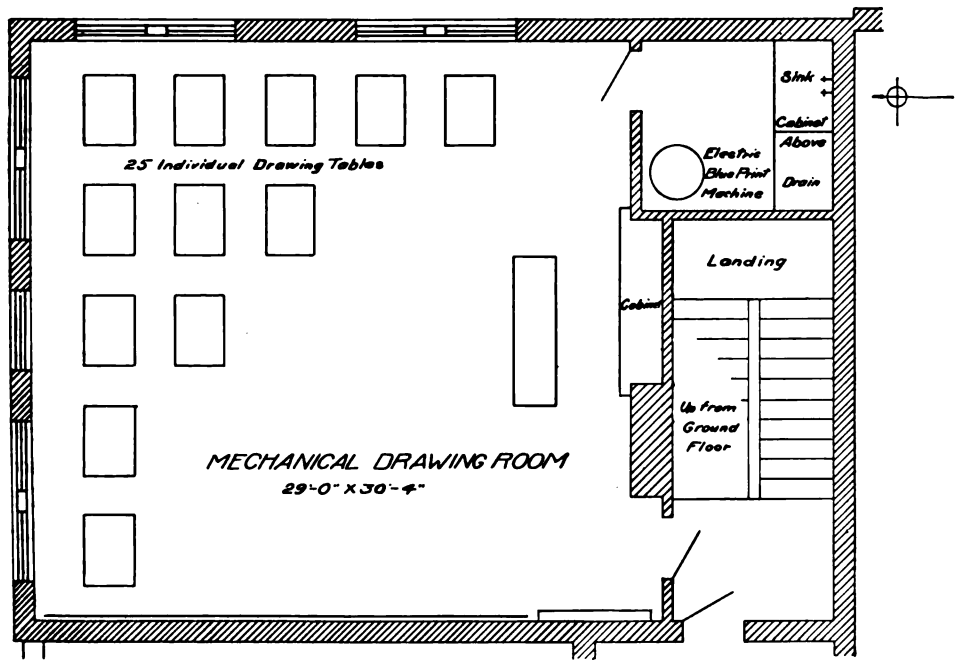


MACHINE SHOP.





MECHANICAL DRAWING ROOM.



DEERFIELD-SHIELDS TWP. H.S. - HIGHLAND PARK - ILL.

also are kept patterns, flasks and various supplies.

Most of the castings made are of such a type as can be used in the machine shop and other departments of the school.

The forge room, 26'x40', is in all respects like the foundry, except that the floor is all wood block. The equipment consists of eight single coal forges and four gas forges accommodating two pupils each, thus being equipped for sixteen students. Then, besides the regular assortment of hand tools, there are a drill, emery grinder, shear, and power hammer. The piping for all forges is under the floor and the blower and exhausters are one unit, direct connected to opposite ends of a single motor shaft. The work done here, too, is of as practical a nature as possible.

The machine shop, 29'x40', when fully equipped, will accommodate from eight to twelve students. The work is open only to fourth year students, and some specials, and is done to a large extent when the instructor is in charge of some other class also, only looking in on the machine shop work occasionally. The equipment consists of two motor-head selective type engine lathes, one universal miller, shaper, speed lathe, universal cutter grinder, hacksaw, wet tool grinder, drill grinder, and sensitive drill, beside the regular equipment

of small tools, including also a portable electric drill and portable electric grinder. Space and outlets are provided for five more lathes, boring mill, emery grinder, planer, surface and cylindrical grinders, and gas oven. These will be added as conditions may demand. All small tools, except a pocket set for each student, such as, cutters, reamers, taps, dies, drills, etc., are kept in the tool room, where the check system also is used. Very little loss of tools occurs and can be checked up immediately. The work is of a practical nature entirely, such things as mandrels, test plugs, face plates, vises, gages, gas engines, and small lathes, lathe centers and arbors being the main part of the course.

The mechanical drawing room, 20'x30', contains twenty-five individual drawing benches, made in the school shop, and having accommodations for six different classes. Work after the first year, is entirely practical, consisting of drawings and blueprints needed in the shops and other departments of the school, besides house plans and designs of engines. It covers a wide range of work during the four years offered. A blueprint room, with an electric blueprinting machine, sink and drying racks, is in direct connection with the drawing room.

A SCHOOL THAT SERVES THE COMMUNITY.

EDWARD G. ANDERSON.

Teacher in an Industrial School Center, Seattle, Washington.

A CHANGE of administrations in the state of Washington caused Charles Briffett, head of the industrial department of the state training school at Chehalis to lose his position. He then became principal of the Fife School, five miles east of Tacoma, and the patrons of this school did their best at the last election to keep the Democrats in power. Their success assures at least two more years of Mr. Briffett's services.

In the three years Mr. Briffett has served as principal of this school, he has raised it from mediocrity to the front rank of model rural schools. His first improvement was to mow the weeds and do some attractive landscape gardening around the buildings. He next tackled the problem of an adequate water supply system and a satisfactory heating plant. A brick building was constructed to house two 5,000 gallon pressure tanks. These are

filled from an artesian well by a motor-driven pump, the pressure being kept constant by an automatic arrangement. The boiler is also in this building, having been removed from the basement.

Among the next improvements were a first class tennis court and an open air gymnasium. The latter is an open build-

have their construction down to a science. More than thirty have been finished. The result has been the formation of a Ukalele Club which gives an added interest to the school work.

I believe some of the best work in the school originates in the domestic science department. Few city schools can boast



THE FIFE SCHOOL NEAR TACOMA, WASHINGTON.

ing 40 by 60 feet and about 30 feet high. This permits of basket ball, volley ball and other games. It is the scene of many exciting match contests.

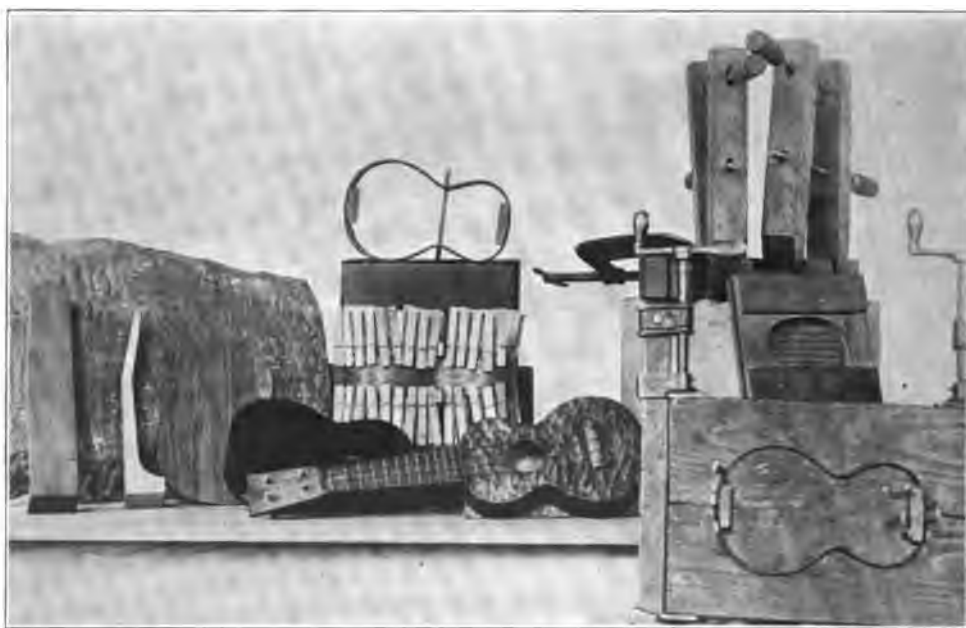
The building which houses the shop and the domestic science laboratory is connected with the main building by a covered passageway. The work in the shop is taught by Mr. Briffett. All the upper grade and high school boys have a one-hour period daily here; but this department is always open and in use. The work is planned to meet the needs of the community. There is no set course. If a boy wishes to build a farm gate the shop is there to serve him. Among the problems under construction I noted a kitchen cabinet, writing desk, dresser, chest, ladder, steam table for the domestic science department, three ball bats, a dozen large willow baskets, and many ukaleles. The boys have specialized in the latter and

a better equipment. This again can be traced directly to the principal. In addition to two three-burner oil stoves and a coal range there are eighteen gasoline burners which give every bit as good service as city gas. Mr. Briffett and the boys installed this system. Gasoline is forced under pressure to the burners thru hollow wire. The burners themselves are an improved type of gasoline stove burner. They have a valve which requires heating at the beginning of a period, but a bunsen pilot light keeps it hot for any length of time afterward, even tho the main flame be turned off. This system meets all the requirements of the underwriters, and could well be installed in all rural schools where the classes are too large to be served by a range.

The girls of this school have a canning club which meets regularly during the summer months. Mr. Briffett supervises



BOYS' UKALELE CLUB, FIFE SCHOOL.



UKALELES IN PROCESS OF MAKING.



GIRLS' UKALELE CLUB, FIFE SCHOOL.

this work altho he hopes soon to have a woman teacher on the job the year round. No woman could hope however, to get much better results, for already this club has won second place in the state fair contests, besides many first awards at the county fairs.

Special emphasis is placed on the work in freehand drawing and design from the primary grade up thru the high school. A graduate of Pratt Institute teaches in the school one day each week, directing the regular teachers and also helping the pupils. Above the sixth grade only the girls take the work in design, altho Mr. Briffett feels that the boys also should continue the study.

The school has an enrollment of one

hundred and seventy—about fifty of these being in the high school department. Three years of the high school work are accredited, but little emphasis is placed on this fact. All the work is planned to meet the present needs of the pupils and not to prepare them for the college or university which a great majority will never attend.

Many other interesting things are done at this school. One teacher has the work in agriculture and athletics. He is employed for the twelve months. He has organized a garden club and a poultry club which have monthly meetings to discuss the best methods in these lines of endeavor.

This is indeed a school that serves the community.

*Like Mr. Brittling, we never know what our children are thinking,
we never know what they think is beautiful—DR. JAMES P. HANEY.*

AN ARCHITECTURAL SHOP PROBLEM.

GEORGE M. MORRIS,

Assistant Director of Manual Arts, Boston, Mass.

IN city schools where there is little opportunity for outside building, the window model will prove of value in acquainting boys with the architectural details of a window and offering opportunities for practice in repair work common to any home, such as replacing a broken cord, resetting a light of glass, filling in holes in plastered walls, etc.

The making of the frame offers a limited opportunity for a bit of bold work with sizable pieces of rough stock. Toenailing, which is too often known to the boys by name only, is here a reality. The framing square comes into use as in common practice in laying off the braces by means of "rise" and "run." The opening may be made to fit any stock window and if desirable the height may be lessened in order that the model may pass thru a low doorway. The problem may be made more difficult by having the boys make the window frame complete, using a stock frame as a guide. The sash should, no doubt, be purchased.

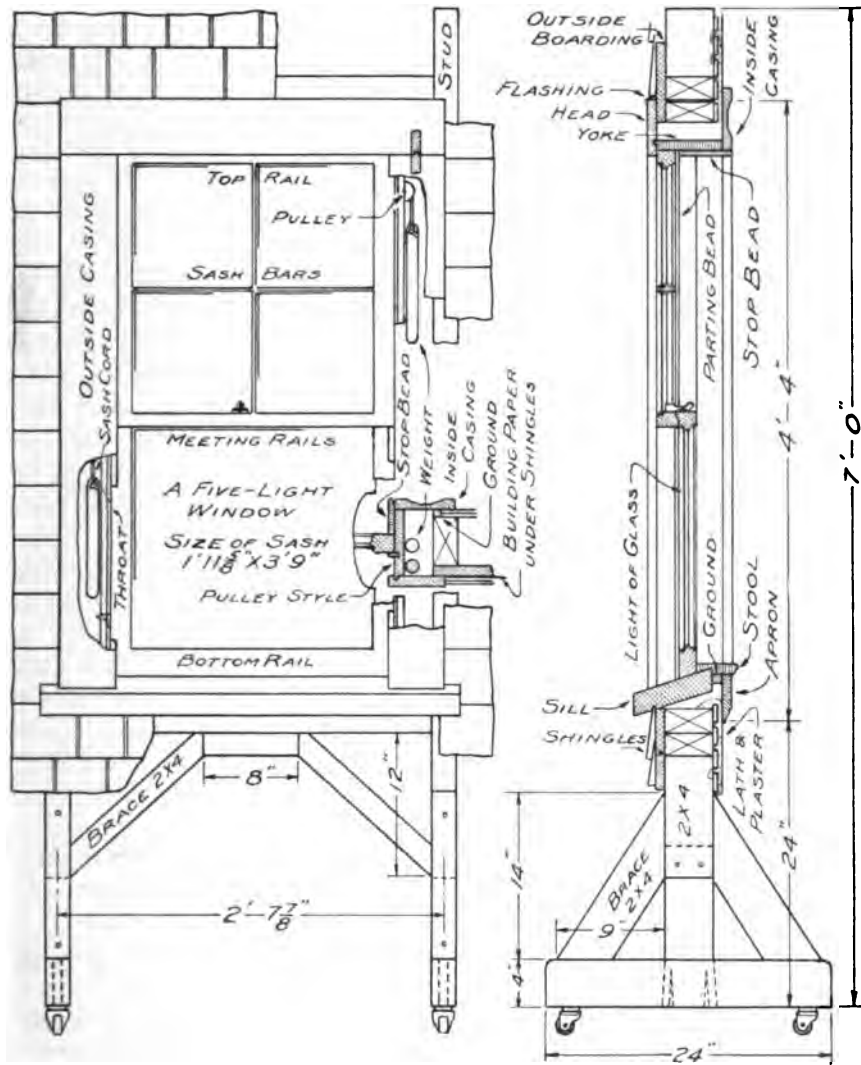
The putting together of any stock window frame is a simple operation as the parts come almost wholly prepared for assembling. If the jambs measure $5\frac{3}{4}$ ", the frame is intended to be set on the boarding; if only $4\frac{3}{4}$ ", the frame is to be set on the studs. Frames may be purchased to suit either condition. It will be found that the inside edges of the pulley stiles and yoke will project $\frac{3}{4}$ " inside of studs in order to allow for the laths and plaster. Sometimes the sill is made so that the seat of the stool is horizontal, making it unnecessary to rabbet out the stool as shown in the drawing. As a school problem, it would be desirable to plane off the sill before assembling to facilitate the fitting of

a hand-made stool. Other features in the construction may vary slightly from the drawing, but for small windows, the details shown are consistent with good practice. For large windows, the opening is framed with 4x4's instead of 2x4's, and wide windows require trussing above.

The partial boarding about the window should be matched stock about 6" wide, and on the model may extend out 5" or 6" at the sides of the opening. Eight penny wire board nails should be used for boarding in. (In practice, the ends of the board are often allowed to extend into the opening to be sawed off later flush with the studs.) The frame may now be placed in the opening, squared into position, and the outside casing nailed thru the boarding into the studs. If necessary, the lower ends of the pulley stiles should be sawed off so that the sill rests on the edge of the boarding at the bottom of the opening. If the yoke or stiles are warped, it will be necessary to spring them into proper line before nailing on the inside casing. This is sometimes done by wedging small blocks in between the window frame and joists.

The singles or clapboards should be laid over a building paper properly placed to serve as flashing above and at the sides of the outside casing. The grounds, which serve to support the inside casing, are put on before the laths and plaster and should line up with the window frame. When the plaster is applied, it is made flush to the surface of the grounds. The laths are spaced $\frac{3}{8}$ " to $\frac{1}{2}$ " apart. Too little space is bad as it is necessary that the plaster pass through between the laths and clinch on the back of them. While the making of the plaster would be de-

MODEL SHOWING
WINDOW DETAILS
SCALE. $\frac{1}{8}" = 1'-0"$



G.M. MORRIS, BOSTON, MASS.

sirable, it might be more feasible to get the small amount needed already mixed from a place nearby, where a building is in process of construction. Plaster is made by slacking quicklime with water and mixing in sand and some binding material such as hair or fiber.

The fitting of the sashes may necessitate some planing as it is desirable to have them run without binding. The bottom rail of the lower sash will need to be bevelled to fit the pitch of the sill and both meeting rails will need slight cutting to allow for the parting bead. Care must be taken to have the top side of the meeting rails exactly flush when the two sashes are in position. The parting beads are usually locked into both the yoke and the sill by very shallow mortising. This necessitates springing them in with the lower sash out of the frame and the upper sash pulled way down. To hang the weights of the upper sash, it will be necessary to have one of the parting beads out, and the throat open. To draw the cord over the pulley down into the pocket, fasten a piece of twine to the end of the cord. Then attach the free end of the twine to a small weight which can be passed over the pulley. This will draw the twine down into the pocket so it can be taken hold of thru the throat. The cord can then be drawn thru the pocket and attached to the weight by means of a bowline on a bite knot. Other knots may do but the bowline is easy to untie and serves admirably for this purpose. The length of the cord may be determined by considering the extreme positions of the sash and by allowing for the knot which is imbedded in the sash. The cords should not be long enough to allow the weights to strike the bottom of the pocket, or short enough to strike the pulley as the sash is raised and lowered.

After the sashes are hung, the stool should be put in and the stop bead at the

top of the frame bradded into position. The vertical stop beads should then be screwed into position with as few screws as will serve, for these have to be removed at times of such repairs as a broken cord or a broken light. Oval headed screws are commonly used for this purpose. Now the inside casing and apron can be cut and nailed securely to both the window frame and the studs. Finish nails should be used here and should be set to allow for puttying and finishing.

With the construction of the model completed, the inside casing may be finished (stained or painted), while the outside may be painted and stained. The shingles would preferably be stained a color suitable for the body of a house and the outside casing painted a trim color to harmonize. All knots should be shellacked before painting or the sap in the knots will show thru the paint some time after drying. On the inside, wall paper may be applied to the partial wall, first sizing the plastered surface with very thin glue to prevent the plaster from absorbing the paste too freely. This bit of paper hanging should be presented with due consideration to the methods of the trade.

An ordinary window shade may be hung and the proper method of placing the fixtures shown. The kind of fixture which has a stop to prevent the inner sash, when raised, from crowding against the roller is the more desirable as any one with experience can testify. If the spring in a shade roller becomes weakened so the shade fails to go up, it may be adjusted by removing the roller from the fixtures with the shade pulled part way down. The shade may then be rolled up on the roller and put back into the fixtures. The tension of the spring will have been increased so the shade will respond satisfactorily. In addition to the shade, curtains for the

window might be designed and made by the girls of the school.

When the model has been finished, there are many ways in which it can be used for demonstration purposes. The patching with plaster of Paris of a hole in the plastered wall, the replacing of a broken cord, replacing a window shade and the setting of a light of glass can all be readily illustrated on the model. As boys are frequently confronted with the job of setting a light of glass, some of the technical points of this process are worthy of more detailed consideration. In removing the sash with the broken light, the sash cords should be knotted so the loose ends will not be drawn into the pockets. The sash may now be taken to a bench where the work of cutting out the old putty can be done to advantage. For this purpose, the chisel should be used with great care to avoid cutting into the wood of the sash. The glazier's points should be taken out with a putty knife or screw-driver and the glass removed. If, owing to accidental cutting of the sash or to a lack of proper priming originally, the wood in the rabbet is raw it should be primed with red lead, paint or shellac. Otherwise the oil in the putty will be absorbed by the raw wood and in time dry up and fall out. If the putty on which the glass was originally bedded has been disturbed, as is likely, it should be replaced with soft putty colored to match the color of the sash inside. The light of glass to be set should be examined for warp, and placed with the concaved

side down, toward the inside of the sash. This insures a bearing for the corners and eliminates danger of cracking the glass when the light is bedded into position and all the points driven into the sash. The points should be placed not nearer than 3" from the corners and can best be driven with a heavy chisel held with the bevel side down on the glass. They should be driven in beyond the edge of the rabbet where they will be concealed by the putty on the outside. The number of points to be used depends on the size of light. As a rule, the amateur is tempted to put in too many points. For a 20x20" light, 2 points on a side placed about 6" from the corners would be sufficient.

The best putty is made of pure raw linseed oil and whiting and should be soft enough to knead easily in the hand. It may be made by the instructor and colored with a coloring material, soluble in oil, such as lamp black or red lead which should be worked with the oil before the whiting is added. The application of putty to the outside of the sash requires considerable care on the part of the non-experienced, but can be done by the tradesman with remarkable rapidity.

The writer is indebted to John C. Brodhead, Associate Director of Manual Arts, Boston, who suggested the problem and pointed out many of its opportunities, and to Miss Jessie L. Burns, a Boston manual training teacher, who contributed the idea of having the model mounted as shown so it could be easily moved about.

There is a danger of the junior high school becoming the dumping ground for the "not over-bright" pupils of the senior high school.

—A. D. DEAN.

EDITORIAL REVIEW OF THE MONTH

SPEEDING UP.

MODERN warfare is new and unwelcome business for America, but we have done other new things efficiently, so why not that? The other day a good subscriber-friend sent us a copy of an official bulletin issued by The Railroad's War Board from which the following is quoted:

An indication of the speed with which materials are being moved is contained in a report from the cantonment at Louisville, Kentucky. Administration buildings there were built from lumber cut in a Mississippi pine forest the week before. The trees were felled on Saturday, kiln dried on Sunday, loaded on freight cars on Monday and delivered at the Louisville site on Wednesday morning. An army of energetic carpenters completed the transformation from forest to Government building just one week from the day the trees had been felled.

We would not suggest that the schools should ever be expected to turn out finished products at this rate, even for war purposes, but we would suggest that they move faster than they have in the past. They can speed up their whole system to a higher efficiency; they can speed up their offering of instruction in vocational training; they can speed up their pedagogical thinking. Fifteenth century thinking will hardly meet present-day war demands.

SPECIAL WARTIME COURSES.

SOME of the schools are speeding up. In Buffalo, under the supervision of Francis H. Wing, the vocational schools are being opened to workmen; special courses are being provided for those who wish to prepare themselves quickly to bear their part in the war emergency confronting the industries of Buffalo. The manufacturers are calling for more trained men, and the schools are going to help furnish

them. To advertise this new opportunity the moving picture machine is being utilized. The processes employed in the industries are being shown by this means to thousands of people.

Springfield, Mass., is considering the modification of the courses in its vocational school to meet war needs. Several other cities are beginning to act in a similar direction. In our September number we summarized what is being done in several endowed trade and technical schools.

SHOPWORK FOR AVIATORS

THE University of Illinois is offering a course in shopwork to the students in its School of Military Aeronautics. The instructor, G. A. Gross, stated in a recent letter that the work does not consist of the usual problems in wood-working and metalworking courses, but is very direct instruction in the use of such hand tools as are likely to be used by an aviator. The tools selected for presentation in this course are (1) claw hammer, (2) hand-saw, (3) keyhole saw, (4) auger-bit, (5) bit brace, (6) chisel, (7) plane, (8) drawing knife, (9) bevel, (10) nail-set, (11) boring tool, (12) oilstone. A set of notes, consisting of 36 pages of mimeographed matter have been compiled to assist in giving instruction.

WAR SERVICE AT DUNWOODY INSTITUTE.

SINCE the entrance of the United States into the War, Dunwoody Institute of Minneapolis has been serving as a recruiting station for the Quartermaster Reserve Corps. More than 500 tradesmen have been enlisted and most of these have already been called into service. Dunwoody has given instruction to 110 truck drivers and 80 radio operators. To

help meet the demand for Morse operators in local railroad and telegraph offices caused by men enlisting in companies at Dunwoody, the Institute rented a local "telegraph college" and offered free instruction both day and evening to civilians. These classes were offered to both men and women, and more than 200 have taken the training. One company of radio operators is now in training at the school. One of Dunwoody's electrical instructors is captain of this company. They have had orders to report to duty early in September.

Fifty-six enlisted men from the Quartermaster Corps are now being trained at Dunwoody for bakers. In teaching this work the Institute has secured the use of a regular army field baker's unit.

Four hundred and seventy navy recruits are now at Dunwoody taking training in the following trades: baking, blacksmithing, carpentry, cooking, copper-smithing, electrical (general), electrical (radio), machine shop and motor boat operation and repair. Each group of navy boys is to receive instruction for four months. The Institute has turned over its cafeteria to the Navy and they feed the boys the regular navy mess three times a day at the school.

In addition to the above, Dunwoody is assisting the State Safety Commission in taking a census of tradesmen of the state.

The war service does not interfere with any of the regular school work that Dunwoody has been doing. In fact, all departments are being continued and some enlarged.

JUNIOR RED CROSS.

A JUNIOR Red Cross with a membership of the 22,000,000 children in the schools of the United States is announced as a new purpose of the Red Cross War Council. The organization has already been launched in accordance with

plans developed by President Mac Cracken of Vassar College. Membership in the Junior Red Cross is to be by schools. As soon as an amount equal to 25 cents for each pupil has been placed in the local school fund the school becomes an auxiliary of the Red Cross and is entitled to display a Red Cross banner. At the same time every pupil will be allowed the honor of wearing a membership button. This vast army of little fingers will help in the manufacture of medical supplies. Manual training and domestic art teachers will give instruction to the pupils doing this war work. This nation-wide movement has grown out of the success of similar work in New York State last spring when over 40,000 articles were made during the last four weeks of the school year.

A RESULT OF FEDERAL CHILD LABOR LAW.

ON the first day of September the Federal Child Labor Law went into effect. No child under 14 years of age may now be employed in a factory, mill, workshop or cannery in the United States if the products of that factory are to be shipped in interstate commerce, and no child under 16 is allowed to work in a mine or quarry. The working day of children 14 and 15 years of age in factories is limited to 8 hours, and the children are not allowed to work between 7 P. M. and 6 A. M. When this law went into effect many boys under 16 were thrown out of employment and into the schools.

It was reported that the factories in Bridgeport, Conn., for example, were unable to fully comply with the new law and that hundreds of young people left the factories. Many of these sought entrance to the trade school in that city. For this reason the school began at once to make provision to accommodate the extra number of students.

ALFRED MOSELY DIES IN LONDON.

A NNOUNCEMENT of the death of Alfred Mosely, Esq. of London on the 22nd of July, in the sixty-second year of his age, recalls to mind this Englishman's genuine interest in American education, his commission of English educators visiting American schools and the return visit of American teachers visiting English schools. It also recalls a personal call at his office in London and the impression gained that here was an Englishman whose patriotism had outgrown the bounds of his own country and had taken in the United States. His was no ordinary friendship. He wanted both countries to be one in the excellence of their educational systems.

Mr. Mosely's death just when the Allied nations are looking to American engineers and scientists to help win the world war stimulates one's hope that on a much larger scale the world may soon see a demonstration of what Mr. Mosely told of seeing in connection with the Boer War in Africa. He told how an American engineer by the name of Louis Seymour, in Natal during the early stages of the Boer War, was able to repair bridges for the British army as fast as they were destroyed by the enemy, thus keeping open lines of communication without which operations in Natal would have been impossible. Seymour finally lost his life while leading some of his men to cover in the defense of a bridge at Zand River. Mr. Mosely said that the British nation owed America a debt of gratitude for this man's engineering work.

It was this incident and his observation of the efficiency of several other American

engineers that caused Mr. Mosely to visit the country and study the system of education "that was responsible" as he said, "for sending so many level-headed men to the Cape." When here he was "astounded" at what he saw, "not so much at the state of development that had been reached at that time" as at what he discerned of the future. He felt that a great country in the hands of such able men was going to play an important part in the future of the world, and exercise an influence over the industries of the United Kingdom. He believed the form of education given in the United States was largely responsible for what he saw.

Then he organized the Mosely Education Commission of twenty-six leading British educators and gave them the following very specific question to answer: "How is it that the United States can afford to pay half a dollar in wages when we pay a shilling, and yet compete with us in the markets of the world?" Their answer was the 400-page report published in 1904. In the preface to the report, Mr. Mosely made it clear that he himself looked for the answer (1) in the development of individuality in the primary grades, (2) in the wide distribution of secondary education, (3) in the instruction in business methods and applied science, and (4) in professional and technical instruction of university grade designed with special reference to business life.

Whatever else may have come from Mr. Mosely's practical statesmanship one thing surely came, and that was sympathy and, to some extent, cooperation between the teachers of the two nations which still continues and which we believe is bearing fruit in the present world crisis.

WASHINGTON CORRESPONDENCE

MANY events of the greatest interest to the friends of vocational education occurred during the month of August. The early part of the week beginning August 13 was used in arranging a temporary organization of the chiefs of divisions of the staff under the Federal Board, and the preparation of tentative plans for the conferences with representatives of the several states, to which reference was made last month. On Friday, August 17th, the conferences began, the first two days being assigned to the New England and North Atlantic states. Thereafter, two days each were assigned to the following groups of states: North Central, Middle Western, Mountain and Pacific Coast, and Southern.

CONFERENCES WITH THE STATES.

THE plan of the conferences provided for an opening general session on the morning of the first day, at which time statements were made by the chairman of the Standing Committee and by the director, outlining the general terms of the Smith-Hughes Act and the purposes of the conferences, and affording opportunity for the discussion of questions of interest to all the states. Then followed sessions one hour in length with the representatives of each state separately, at which the preliminary plan of that state was presented and its special problems discussed. These conferences were attended by the members of the Standing Committee, the director and his staff, and the representatives of the several states.

In addition, the afternoons and evenings were set aside for conferences between the representatives of the states and the individual members of the staff for discussion of detailed questions relating to proposed plans for agricultural education, in-

dustrial education, and home economics education, respectively.

The general statement made by the chairman included the announcement that the Federal Board has appointed as Director Dr. Charles A. Prosser, of Minneapolis, and on his recommendation has appointed the following assistant directors: for agricultural education, Layton S. Hawkins, of Albany, N. Y.; for industrial education, Lewis H. Carris, of Trenton, N. J.; for home economics education, Miss Josephine T. Berry, of Minneapolis, Minn.; for research, Charles H. Winslow, of Washington, D. C.

ACTION TAKEN BY THE STATES.

THE Smith-Hughes Act provides that in order to secure the benefits of the Federal appropriation for any state the legislature (or the governor, if the legislature does not meet in 1917) must formally accept the provisions of the Act, and "designate or create a state board, consisting of not less than three members, * * * to co-operate * * * with the Federal Board * * * in the administration of the provisions of this Act."

At the time the conferences were held, all but six of the states had accepted the provisions of the Act. Of the 48 states, 26 have designated (or created) the State Board of Education for this purpose, as follows:

Arizona	New Jersey
Arkansas	New Mexico
California	Ohio
Connecticut	Pennsylvania
Delaware	South Carolina
Florida	South Dakota
Indiana	Tennessee
Kansas	Texas
Louisiana	Utah
Massachusetts	Vermont
Missouri	Virginia
Montana	Washington
Nevada	Wyoming



LAYTON S. HAWKINS, assistant director for agricultural education, was born in New York, and was graduated from the State Normal School at Cortland, N. Y., and from Amherst College, from which institution he received the degree of A. B. in 1904, and A. M. in 1907. He has also done some graduate work at Cornell University. He began teaching in a one-room rural school, teaching school in the winter and running the farm during vacation. He taught agriculture and science at the Cortland Normal School, and for six summers in the Cornell Summer Session. Since 1912 he has been state agent for agricultural education and since May 1st, 1917, chief of the Division of Agricultural and Industrial Education, State Department of Education, Albany, N. Y.



LEWIS H. CARRIS, assistant director for industrial education, is a native of New York State, and holds the degrees of B. L. from Hobart College, Geneva, N. Y., and A. M. from Teachers College, Columbia University. He began teaching in a one-room rural school, and has been successively village and city superintendent of schools, principal of city grammar school, and county superintendent of schools. He organized and was for five years director of public evening schools in Newark, N. J. Since 1912 he has been assistant commissioner of education, in charge of vocational education, State Department of Public Instruction, Trenton, N. J.

In eight states the legislature designated or created a State Board for Vocational Education, including in its membership the state superintendent of public instruction (except Oklahoma, chairman of the State Board of Education). These states, with the number of the members of the Board, are as follows:

Georgia, 7	Nebraska, 3
Iowa, 3	New Hampshire, 5
Maine, 3	North Carolina, 3
Michigan, 4	Oklahoma, 5

Wisconsin might also have been included in the foregoing list, but is included rather in the following group of five states in which special boards already in existence were designated:

Colorado, State Board of Agriculture.
Minnesota, State High School Board.

New York, State Board of Regents (substantially the same functions as the State Board of Education in other states, but more authority over the schools than is the case in some states.

West Virginia, State Board of Regents.

Wisconsin, State Board for Vocational Education.

In three states the governor appointed a board consisting of the state superintendent of public instruction and four additional members:

Alabama.
Mississippi.
Oregon.

In the following six states the provisions of the Act have not been formally accepted:

Idaho	Maryland
Illinois	North Dakota
Kentucky	Rhode Island

ANNOUNCEMENT OF POLICIES DEFERRED.

IT was made clear to all in attendance that the conferences were entirely informal, constituting a preliminary effort



MISS JOSEPHINE T. BERRY, assistant director for home economics education, is a native of Kansas, and hold the degrees of A. B. from the University of Kansas, and B. S. and M. S. from Teachers College, Columbia University, and has completed one additional year of graduate work at Yale University. She began her teaching career in the public elementary schools of Missouri, was for two years librarian of the Kansas State Agricultural College, and later superintendent of schools and principal of high school. After her residence at Columbia University, she was appointed instructor in household administration at the University of Chicago, and then was for four years head of the department of home economics at the State Normal School, DeKalb, Ill. After two years in a similar position in the State College, Pullman, Wash., she became, in 1913, head of the department of home economics in the University of Minnesota, Minneapolis.



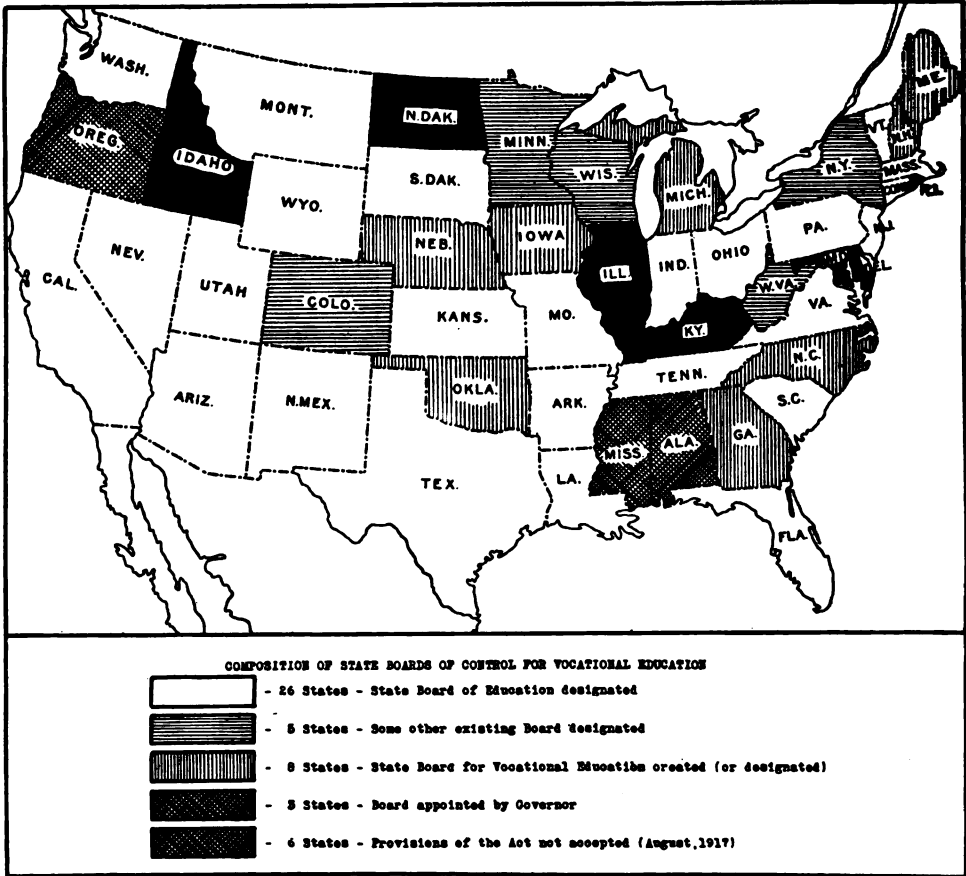
CHARLES H. WINSLOW, assistant director for research, was born in Maine, and attended public and private schools in Massachusetts. Served apprenticeship as a saw-maker in Fitchburg, Mass., and followed the trade for 21 years. He was a member of the Massachusetts Legislature for two terms, 1903-04, and special agent for the Massachusetts Bureau of Labor Statistics for one year. As a member of the Massachusetts Commission on Industrial Education, 1906-09, he spent considerable time in studying industrial schools in England, Ireland, Scotland, Germany, France, Belgium, and Holland. In 1910 he wrote the Report on Industrial Education for the American Federation of Labor. From 1910 to 1916 he was special agent for the Federal Bureau of Labor Statistics, writing the 25th Annual Report in 1910. He has served as director of a number of important surveys, including Richmond, Va., and the garment making industries in New York City. He was also a member of the Commission on Federal Aid to Vocational Education appointed by President Wilson in 1914. In 1916 he was director of vocational research for the Indiana State Board of Education. During the summer of 1917 he spent six weeks on a preliminary study of Canadian plans for the vocational re-education of maimed and crippled soldiers, for the American Red Cross.

to define the major problems that must be passed upon by the full Board, and to afford the representatives of the states opportunity for a hearing. At that time the Board was still without counsel, and in the absence of legal advice it was impossible to determine the limits of correct procedure in many particulars. With respect to a number of important matters the chairman and the director were able to announce policies which the Standing Committee was prepared to recommend to the Federal Board for adoption, but for the most part the discussions proceeded on the basis of interchange of personal opinion.

From the discussion it appears safe to conclude that the Federal Board will probably not attempt to draft a set of rules and regulations prescribing uniform stand-

ards or procedure for all states, but rather that it will deal with each state separately, so far as practicable. The Board will occupy a receptive attitude, requesting the state to take the initiative in formulating its own plan for meeting the requirements of the Act. After the plan has been considered and approved the state will be free to work out the details in accordance with the terms agreed upon, submitting to the Federal Board satisfactory evidence that the work is so done. The Federal Board will, of course, offer advice and suggestion *whenever these are sought.*

The Federal Board apparently will look with favor upon a state plan which



proposes to apportion the available Federal funds among a limited number of strategic or experimental projects, with the idea of thus setting up high standards for emulation thruout the state, in preference to a plan which proposes to divide the fund equally or pro rata among all the schools of the state which qualify or which ask for aid.

Attention was called repeatedly to the fact that the law requires that the Federal Board shall "annually ascertain whether the several states are using, or are prepared to use, the money received by them in accordance with the provisions of this Act." It is likely that this section will be taken advantage of by the State Boards as providing opportunity for an annual revision of the contract entered into by

each state with the Federal Board, and for progressive raising of standards.

TRAINING OF TEACHERS.

THERE was much informal discussion at the conferences of the question as to what institutions will be called upon to offer special courses for the preparation of vocational teachers, and especially industrial teachers. The general trend of the discussion indicated that the method of approach to the solution of this question will be thru a determination of the qualifications to be required of teachers, and then of the measures deemed essential for insuring the acquisition of these qualifications.

It may be assumed, for example, that the teacher of industrial shopwork will be

required, among other things, to have had some special professional training, and to have had experience of from two to six years as a skilled journeyman in the trade he is to teach. To secure this combination of qualifications, special courses of instruction must be provided in institutions located at sources of available supply of skilled mechanics—almost necessarily in large industrial centers.

Further, the courses must be of such length and offered at such times as will cause them to appeal to prospective teachers. To some extent it will be necessary to depend on the training of teachers in service.

Two reasons were mentioned in the informal discussion for the opinion that probably not much training of special teachers for industrial shopwork will be attempted in the regular state normal schools, except in cases of certain individual institutions particularly well situated and well equipped:

(1) These schools are frequently located in small communities, at a distance from available sources of skilled workers from which to draw prospective industrial teachers.

(2) There is a growing belief that the great task of the state normal school is primarily to prepare teachers for the regular elementary public school system of the state, and that until this task is more completely and effectively discharged than it is at present in many states it is inexpedient to divert any of the slender resources of these institutions to other tasks, however pressing or worthy of attention.

VARIETY OF PROBLEMS.

IN summarizing the results of the conferences Chairman Munroe empha-

sized the great variety of practical problems presented by the representatives of the several states. Speaking for the Standing Committee, he expressed the conviction that this opportunity for personal contact with state officers, and for first-hand consideration of the difficulties and problems involved in widely divergent conditions, will bear immediate fruit in a more intelligent and sympathetic approach to the great task of the Federal Board than would have been possible otherwise.

OFFICES OF THE BOARD.

TEMPORARY quarters for the Board were provided by the Department of the Interior, and the conferences with the states were held in the offices of the Bureau of Education, in the Pension Building.

On Thursday, August 30, the Board moved to rented quarters on the fifth floor of the Ouray Building, at 8th and G Streets, N. W. Charles E. Alden, formerly private secretary to Senator Page, has been appointed chief clerk for the Federal Board. Under the rules of the Civil Service Commission, all of the appointments thus far announced are temporary, except that of the assistant director for research.

Except in the case of the director, it appears probable that the policy of the Board will be to pay no salaries in excess of the amount received by the civilian members of the Board, \$5,000 per annum. The maximum salary provided for assistant directors thus far is \$4,500, and it is expected that salaries for subordinate positions will be adjusted to correspond with schedules of salaries for analogous positions in other departments of the government service.

OPEN QUESTIONS¹

"There is more to be said on this subject."

"FIRST-AID" COURSES AGAIN.

Doubtless some of our readers remember the correspondence published in these columns several months ago relating to the calls for help that frequently come to directors of teacher training courses. Recipients of these appeals write to the editors asking if something may not be done to convince teachers and principals that there is no such thing as a "get-ready-quick" course for the preparation of the manual arts teacher. The editors, having expressed themselves on this point a number of times, offer the following correspondence without comment:

First Letter

Dear Mr.

I have just been elected to a position as instructor in manual training and I am writing to you for help. I attended your Normal School one year but as you know I did not take manual training. Are there any text-books published on the subject, or is there a book that I can read that will prepare me for the work before school begins?

Please give me an outline of the work expected the first year and a list of the tools that that I might need.

I expect to call upon you often this year for I must make good.

Yours truly,

Miss A.... B....

Second Letter

Dear Mr.

We have decided to put manual training in our schools next year, and as I have never had any training along that line, I am writing to you for some information.

What book, if any, would you recommend as a text-book? Will you please give me a complete list of tools that we should buy (with very limited means)? How many boys could work on one bench? What supplies should we buy for a year's work?

¹Note: Readers are cordially invited to send to the editor of this department, discussions of any points taken up in the department, and brief contributions on any topic interesting to teachers of shopwork.

I would also appreciate it if you would send me a complete outline or course of study that will cover one year's work in manual training. Any other information you might be able to give me that you think I might need in the first year will be appreciated, for I must teach the subject myself.

Yours truly,

.....
Superintendent of Public Schools.

To the foregoing letter the following reply was sent by our correspondent:

Dear Mr.

If you are contemplating a real manual training department in your schools, I suggest that you secure the services of a teacher who has had some training along that line, or else that you take some special training yourself. If you can do no better, attend a summer session, and get in touch with the work so you will know just what to do in arranging your course, buying your tools, and securing your supplies.

There is no book published that will tell you all you ought to know about manual training, and it is only the actual experience in the shop that can give you the proper insight into the work.

We are offering courses every summer that will give you just what you need, as far as it goes, and I would be glad to see you in or some other school this summer getting acquainted with the manual training work, so that you may with more intelligence start your work at

I am sending you a copy of our course of study so that you may see what is expected of a manual training teacher.

Yours truly,

.....
Director of Manual Training,
.....State Normal School.

Third Letter

Dear Mr.

I am to teach school in next winter, where it is intended to introduce manual arts. I shall greatly appreciate it if you will send me any literature on the subject or suggestions. I do not want statistics, or arguments about the desirability of the work,—just an outline of ob-

jects, list of materials, every thing up to and including the 8th grade.

The course will have to begin modestly, but I want it to succeed; then it will stay.

If you can recommend some manual with a course in the different grades outlined, I shall be glad to buy it. I do not want a course of study for myself, but a definite outline, somewhat like a menu for a cook.

Very sincerely,

.....

What reply would *you* have sent to this inquiry?

PROPORTIONS OF WOOD JOINTS.

Mr. Editor:

I am not able to give a table stating correct thicknesses, widths and lengths of mortise-and-tenon joints but I can give you the rule used in factories and mills where this line of work is done.

If a rule were figured out in fine fractional parts of an inch for thickness of a tenon, it seems to me that it would be useless, as mortiser bits are made in standard sizes varying by $\frac{1}{16}$ of an inch.

The thickness of stock, of course, regulates the thickness of the tenon. It is general practice to divide this thickness into three equal parts and then take the mortiser bit which is the next size larger. That is, if stock is $\frac{3}{4}$ ", $1\frac{1}{8}$ ", or $\frac{7}{8}$ ", the thickness of the tenon should be $\frac{1}{4}$ ".

If the stock is $1\frac{1}{8}$ ", 1", or $1\frac{1}{4}$ ", then the $\frac{3}{8}$ " bit is used, and so on. This applies only where the stock to be mortised and the stock to be tenoned are the same thickness. In cases like a table rail, tenoning into a table leg, the tenon is made heavier.

As to the width of a tenon, I would say that anything wider than 7" should be divided, and a double tenon used. This is done to prevent making such a long mortise which would be weak.

As to the relish or notch taken out of the corner of the tenon, this varies with the width of stock. Stock two inches wide would be relished $\frac{3}{8}$ ", while stock seven inches wide would be relished $1\frac{1}{2}$ inches. However, this relish is put only on one corner and its purpose is to avoid mortising out to the end of the stock.

As for the length of tenon, this is, in most

all cases, regulated by the width of the stock. A general practice is to mortise three-fourths of the way thru where the stock is less than two inches. If stock is wider, this length is increased somewhat.

As for the dowel joints, I am of the opinion that they give such poor service and are used on such cheap construction that they should never be introduced into school work.

H. L. HURFF,

Bradley Institute.

Dear Mr. Editor:

I wish to add a word on the subject of "Proportions for mortise-and-tenon joints" to that already printed in the September number of your magazine.

It seems to be quite a common practice in mills on the Coast here to use tenons $\frac{1}{8}$ " thick for $1\frac{1}{2}$ " stock, $\frac{3}{8}$ " tenons for 1" stock and $\frac{1}{2}$ " tenons for stock from $1\frac{1}{2}$ to 2 inches in thickness.

In general the tenons commonly used vary from one-quarter to one-third the thickness of the furnished stock on doors, screens, etc. The length of the tenons is rarely over six times their thickness and should not be shorter than four times their thickness if they can be made longer.

The mortise should be $\frac{1}{8}$ " deeper than the length of the tenon so as to permit the shoulders to draw up tight. The common rails of doors and paneled pieces have tenons the full width of stock, but the top and bottom rails have the tenons relished so that the mortise will be a blind and not an open mortise in the stiles; this relishing reduces the width of the tenon from $\frac{1}{2}$ " to $1\frac{1}{2}$ " on rails $4\frac{1}{2}$ " and 9" respectively.

The diameter of dowel to use for various thicknesses of stock is about the same as the thickness of tenons, one-fourth to one-third the finished thickness. The dowels should be cut from hard wood in all cases, and the length may vary from 8 to 12 times the diameter, one-half the length entering each piece. The dowel hole should not be more than $\frac{1}{8}$ " deeper than the length of dowel to be used, especially on 1" lumber or less. The shrinking of the glue in that part of the hole not filled by the dowel will cause ugly spots to form on the surface of the work.

JOHN E. DOREN,

Instructor in Carpentry and Millwork,

Technical High School, Oakland, Calif.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

SEWING CABINET.¹

THE project shown in the accompanying photograph and drawings is a good problem for high school classes in cabinet making. In the construction of the piece it was found desirable to turn the legs in two parts, and have the joint come immediately above the upper bead. The inlay was built up of holly and mahogany. The entire cabinet was made of mahogany—stained, filled, and varnished. The cabinet was the work of Charles Zaenglein, Circleville, Ohio.



SEWING CABINET.

ROUND TOP TABLE.

A definite attempt has been made at Bradley Institute to apply the knowledge gained in wood-turning to later courses in furniture making. The accompanying illustration shows some of the pieces made. The round top table was designed and made by Grover Flanigam of Danville, Ill. The legs are made of three pieces in order to save on material, as the large bead is so much greater in diameter than the

¹These problems were designed in the constructive design class and made in the furniture making class at Bradley Institute.

part above or below. The rails were band-sawed to approximate size and then finished with hand tools. The groove for the inlay is cut while the top is mounted in the lathe. Walnut was used for the entire project.



ROUND TOP TABLE.

WRITING TABLE.

A writing table is often in demand by students in high school woodworking classes. The drawing presents a project which was worked out very satisfactorily by Harold Huntington, of Dickson, N. Dak. Walnut was used for the material, finished natural.

CRICKET.

The cricket shown in the photograph is a good problem in turning and fine workmanship with hand tools. The legs are made of several pieces and afterward assembled. The stretcher is made of a considerable number of pieces, thirteen in all, in order to avoid cutting across

the grain. The top affords an opportunity for experience in upholstery. This piece was designed and made by Glen Herschberger, Aitken, Minnesota.

DESK TABLE.

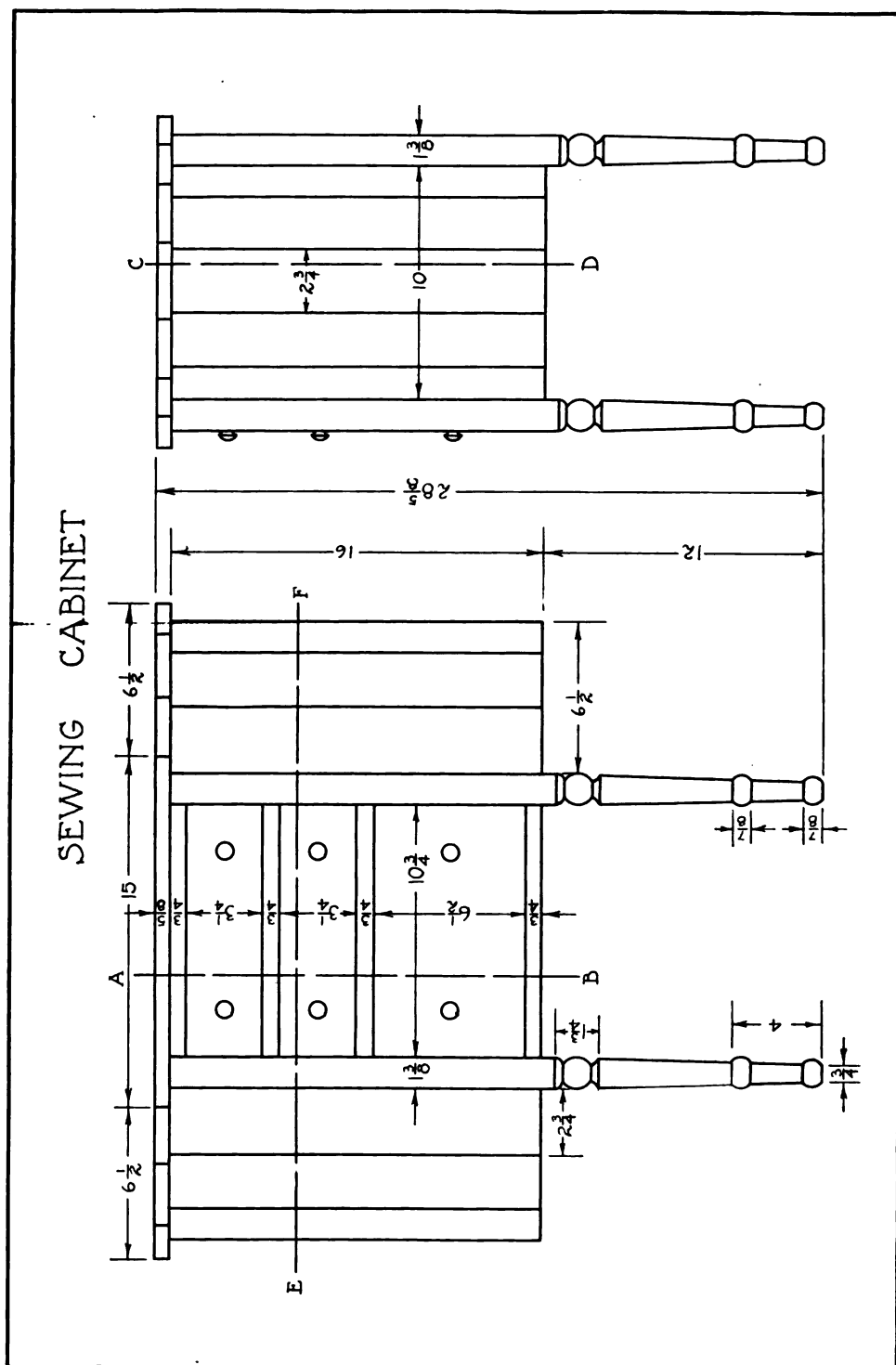
A handsome piece of furniture is shown in the illustration of the gumwood desk-table. The top, drawer fronts, and side rails are veneered, while the legs and drawer supports are made of solid gumwood. The design calls for inlay borders which were omitted in the actual construction because of the beauty of the gumwood veneer. This table was designed and made by Albert Wiegman, Decatur, Ill.



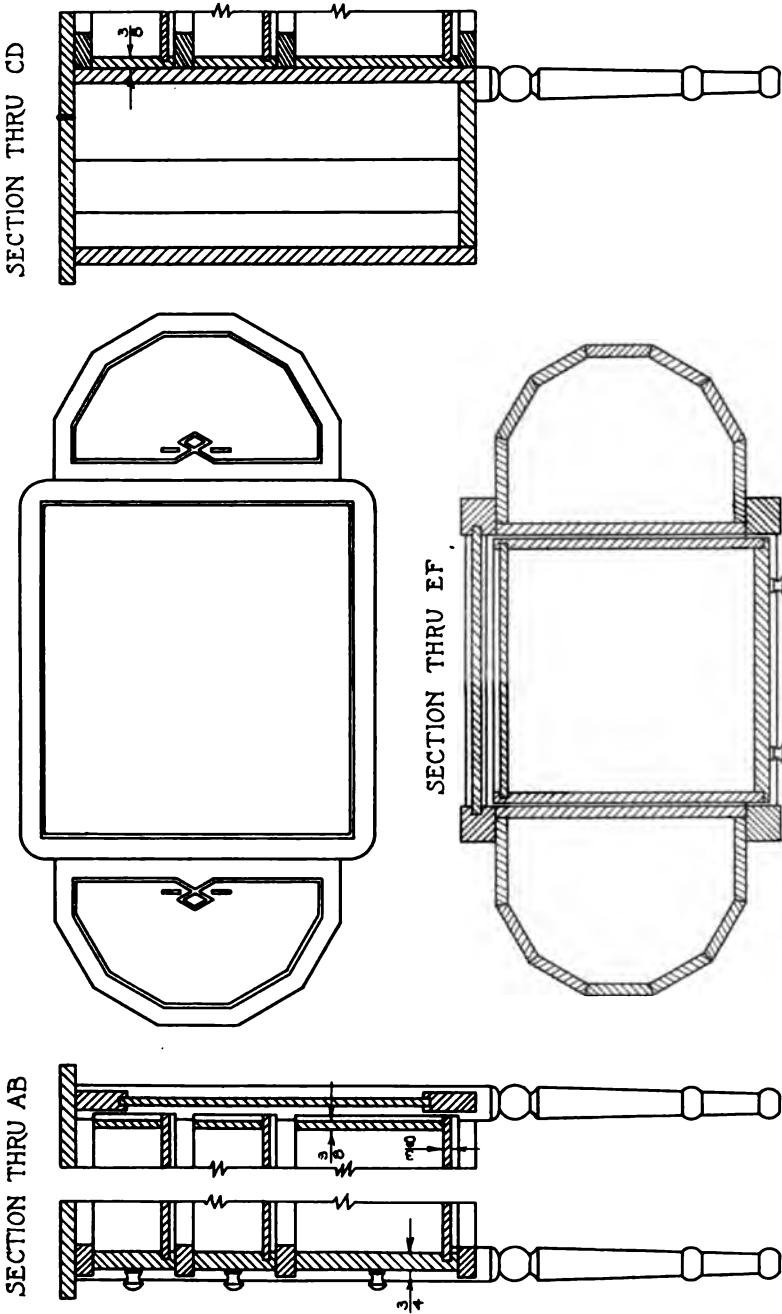
CRICKET.



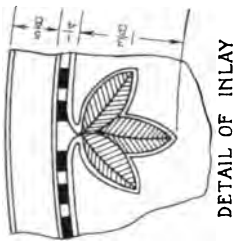
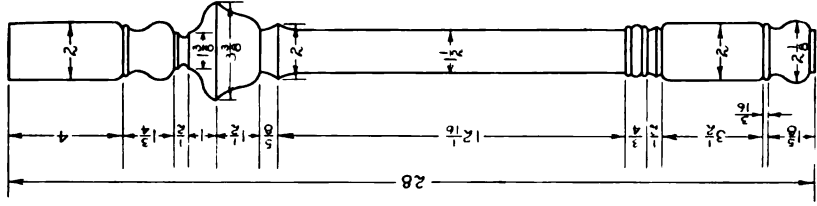
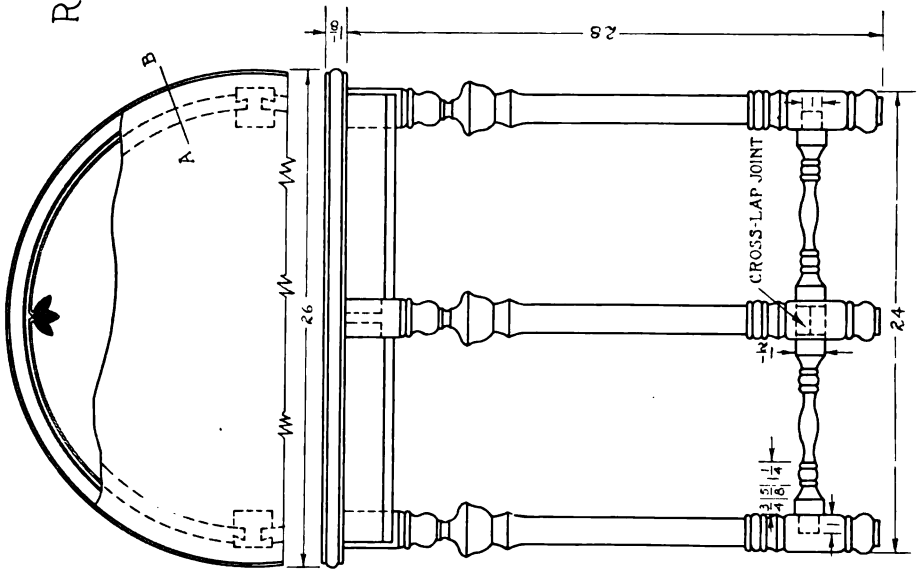
DESK TABLE.



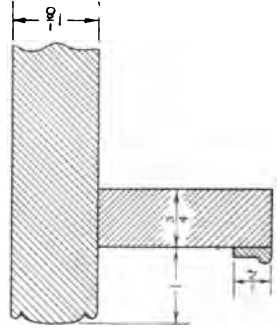
SEWING CABINET
DETAILS



ROUND TOP TABLE

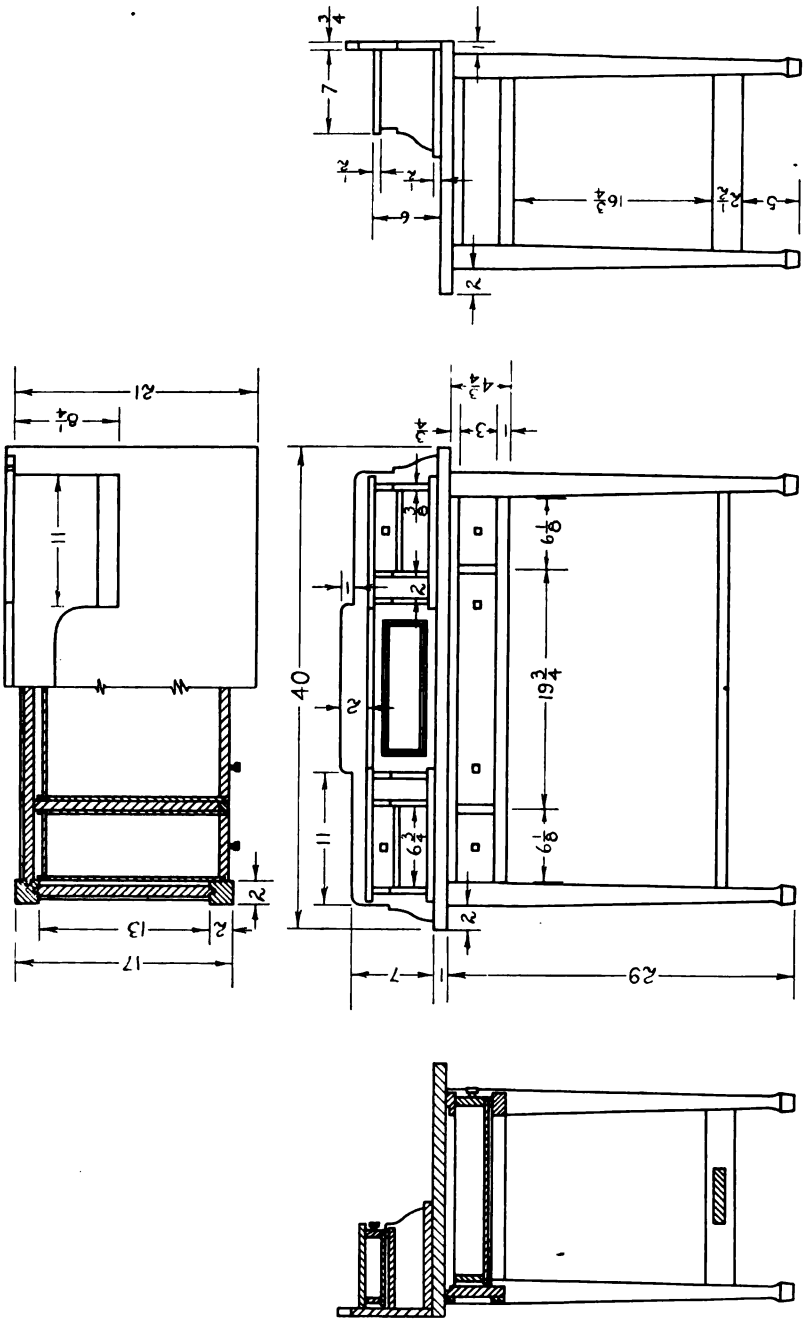


DETAIL OF INLAY

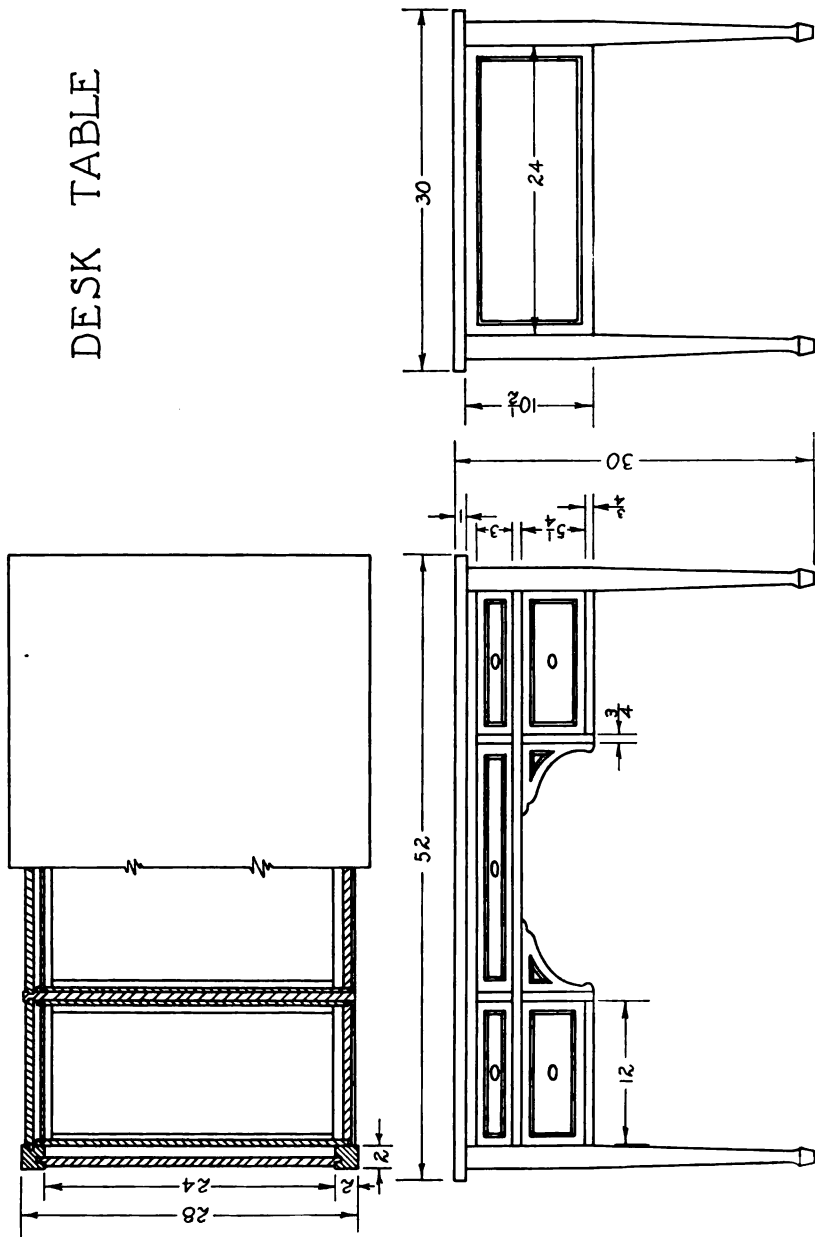


SECTION THRU AB

WRITING TABLE



DESK TABLE



CURRENT PUBLICATIONS

Machine Drawing, by Ralph W. Hills, instructor in mechanical drawing, University of Wisconsin. McGraw-Hill Book Co., New York City, 1917. Size, 6 x 9 in.; 92 pages, 119 diagrams; price, \$1.00.

This book aims to teach the fundamental principles of mechanical drawing to men who wish to become draftsmen, or who for any other reason wish to acquire a working knowledge of the subject as practiced in the best drafting offices. The material in this volume is the first half of the instruction papers in machine drawing, as developed and used by the Extension Division of the University of Wisconsin. The subject is presented thru a series of working drawing problems with sufficient notes to give a good understanding of the principles involved in each problem.

Both in text matter and drawings this book presents a high standard in clearness and directness of treatment. It is an excellent book for the purpose intended.

Modeling and Sculpture, by Albert Toft. Published by Seeley, Service & Co., Limited, London, 1915. Size 5½ x 8 in.; 348 pages, 118 illustrations and diagrams; price, \$2.00.

This book is written by a professional sculptor and it describes the methods and processes employed in his art. It deals exclusively with the technical side of plastic art and is therefore just what the student wants. We have seen no other book on this subject of equal value for a craftsman's reference library.

Domestic Architecture, by L. Eugene Robinson, assistant professor of rural architecture, Oregon Agricultural College. The Macmillan Company, New York City, 1917. Size, 5 x 7½ in.; 378 pages.

All who are interested in house problems will be glad to see this book, but especially it will be welcomed by teachers who are giving instruction in house design and construction to students of home economics. It deals with simple everyday things pertaining to houses as they are being taught in the most progressive schools and colleges. Some of the topics treated are: history of domestic architecture, domestic architecture in the United States, building sites, house design, interior design and architectural furniture, character and mouldings, common building materials, house construction, interior finish, house furnishing, appliances,

heating and ventilating, lighting, plumbing, gardens, and grounds, and cost of dwellings.

How to Make Concrete Garden Furniture and Accessories, edited by John T. Fallon. Robert M. McBride & Co., New York, 1917. Size, 7¼ x 10 in.; 105 pages, and plates of 19 halftones; 33 diagrams in text; price, \$1.50.

The character of this book is readily seen from the following chapter headings: The selection and testing of Material; how to proportion and mix materials; making forms and placing the concrete; how to make garden walls, steps, and other simple utilities; how to make sundials, benches and swimming pools; bird baths, lanterns, pottery and water gardens; making garden frames and garden rollers. It is valuable for a teacher's working library.

Veneering and Inlaying, by G. M. Nyman. Published by the Woodward High School Printing Class, Cincinnati, Ohio, 1917. Size, 4¼ x 7½ in.; 46 pages.

The material in this helpful little book first appeared as a series of articles in the *Industrial Arts Magazine*. It is the outgrowth of the author's practical shop experience and his observations as a teacher.

Household Manufactures in the United States, 1640-1860, by Rolla Milton Troyon, assistant professor of the teaching of history, University of Chicago. The University of Chicago Press, Chicago, 1917. Size, 5¼ x 7¾ in.; 413 pages; price, \$2.00, net.

In this book are brought together facts of value to students of industrial history, and of special value in providing a historical background for courses in domestic science and household arts. Teachers of these subjects will find it of great value. It is essentially a description of the gradual transition from family-made to shop-made or factory-made goods.

Essentials of Mechanical Drafting, by Ludwig Frank, instructor in drawing, High School of Commerce, Boston. Milton Bradley Company, Springfield, Mass., 1917. Size, 7 x 10¼ in.; 132 pages, 224 diagrams; price, \$1.50.

The purpose of this book is to provide the student with definite comprehensive text and illustrations covering the theory and practice of mechanical drafting. It is not a course of study, but is intended to effectively supplement and give emphasis to the work of any teacher in any course of problems he may see fit to fol-

low. It presents fundamentals covering a rather wide range. It may be spoken of as being adapted to a rather broad, general course in mechanical drawing. However, in its treatment of working drawings it gives emphasis to machine drawing.

The book is well put together, well printed and the illustrations represent good technic.

Applied Drawing, by Harold Haven Brown, Atkinson, Mentzer & Co., Chicago, 1916; 8½ x 6 inches, 266 pages; price, \$1.00.

This most attractive volume treats of the three foundation types of drawing—pictorial, decorative and mechanical. In the preparation of the book; Mr. Brown was assisted by James Hall, Estelle Peel Izor, Ernest W. Watson, and Haymond Ensign, each of whom wrote one or more chapters. The book, therefore, brings into small compass the results of the rich experience of America's leading teachers of drawing in elementary and secondary schools. The book is essentially a condensed treatment of carefully selected types of drawing. It cannot fail to be of great value to teachers.

RECEIVED.

Woodwork for the Grammar Grades, by W. B. Givens, State Normal School, Fresno, Calif. This is a bulletin published by the school and is intended to answer questions that are often asked concerning equipment, courses of study, etc.

Seventeenth Annual Report of the Director of Education, Philippine Islands, Bureau of Printing, Manila. Gives a large amount of space to industrial and agricultural education—the work for which the Philippine schools have become famous.

Three Short Courses in Home Making, by Carrie A. Lyford, specialist in Home Economics, U. S. Bureau of Education, Washington, D. C. This valuable bulletin gives 20 lessons in care of the home, 20 lessons in cooking and 20 lessons in sewing. All are intended for rural schools.

Department of Vocational Education, Indiana University, Bloomington, Ind. A bulletin describing the organization and scope of the departments and outlining courses for teachers.

Development of Arithmetic as a School Subject, by Walter Scott Monroe, professor of school administration, Kansas State Normal

School. A bulletin published by the U. S. Bureau of Education, Washington, D. C.

Home Drying Manual for Vegetables and Fruits. A pamphlet published by the National Emergency Food Garden Commission, 210-220 Maryland Building, Washington, D. C.

Architectural Preparedness and Food Conservation. A study in thrift. This pamphlet includes the papers on "Thrift Education" presented at the Portland meeting of the National Council of Education last July. Arthur H. Chamberlain, editor of the *Sierra Educational News*, San Francisco, was the chairman of the committee under whom the program was presented.

Night Schools and Night Classes in Trade and Industry, by K. G. Smith. Bulletin of the Engineering Extension Department of the Iowa State College, Ames, Iowa.

Industrial Education. Report of a committee of the National Association of Manufacturers presented May, 1917. Issued from the Secretary's office, 30 Church St., New York City.

What Mechanics and Technicians Can Do for Their Country. Compiled by Chas. A. Prosser. A 32-page pamphlet published by Dunwoody Institute, Minneapolis, Minn. Contains a great deal of information that patriotic men are looking for at the present time.

Survey of the Library's Work with the Schools. In the June, 1917, number of the bulletin issued by the Grand Rapids Public Library, Grand Rapids, Michigan.

Education. A reprint from the "Proceedings of the Engineers' Club of Philadelphia," for May, 1917, giving illustrated accounts of engineering, technical and trade schools in and near Philadelphia. It includes the Williamson School of Mechanical Trades.

Abstract of the Census of Manufacturers, 1914. Prepared by the Bureau of the Census, U. S. Department of Commerce, Washington, D. C. Samuel L. Rogers, director. Contains 722 pages; price, 65 cents. It gives in condensed form all the essential statistics collected thru the census of 1914.

Examples of Battery Engineering, by F. E. Austin. Published by the author, Box 441, Hanover, N. H. Size, 4¾ x 7½ in.; 90 pages; price, \$1.25 This book is organized in the form of sixteen lessons.

MANUAL TRAINING MAGAZINE

NOVEMBER, 1917

RELATED WORK.

EGBERT E. McNARY.

Director of Industrial Education, Springfield, Massachusetts.

This is the first of a series of articles by Mr. McNary on academic work related to shopwork. Mr. McNary has been especially successful in developing such work during the past few years. Later articles will deal with related English, related arithmetic, related geography, and related history.—The Editors.

IN our grammar schools and junior high schools, shopwork and related work are coming to be recognized as a unit of instruction. John with other boys, is working on an order for one hundred sleds. He writes an acceptance of the order, draws up his specifications, writes orders for the wood, for steel for the runners and braces, and for the hardware. He makes an estimate of the cost, prepares working drawings, notes the nature of the wood and the qualities of the steel. As the shop porcesses progress he draws up operation sheets, keeps the time, looks up sources of materials, traces out routes of shipment from the source to the school, studies historical references on steel making continuing a wide scope of related work until the sleds are built, painted and varnished, cost rendered, shop notes written up and the charge entered.

Time allotment for shopwork in our public schools may well be considered in connection with this related work. Naturally shop teachers are convinced that the average amount of time given to shopwork is far too limited. A fair consideration of this question should take into account the aims for which the shopwork is given. It

is not the function of this paper to discuss these aims, but it is proposed to point out that where extended time in shopwork is proposed in a general education course, the shop time must be justified in terms of general education. In a trade training or industrial course, the extended shop time is demanded for giving skill in operations and completeness of experience, and is justified in terms of special education. If the two aims of general and special education are confused, no justification for extended shop time is possible. It has been demonstrated however that extended time for practical shopwork linked with well-organized related work can be fully justified in a general education course.

Shopwork in a general education course should not be given more time on the ground of more skill, as in the case of carpentry or in printing, but more shop time could be justified if it is shown to result in greater facility in English expression, appreciation of history, understanding in science, ability in arithmetic and so on thru the list of factors that contribute toward training members of society. If live shopwork, chosen with consideration for the needs of the children and the activities

of the community, is linked up with general education thru an effective scheme of related work, there will be no difficulty in justifying a fairly large apportionment of shop time in the school curriculum. When the term "shop" is used, it is intended to

taken from the shop and worked out in the classroom without any more interest or effectiveness than the text-book problems? In such cases this was not related work because the pupils were not led to feel the relation between the shop experience and

PRACTICAL ARTS DEPARTMENT
RELATED WORK

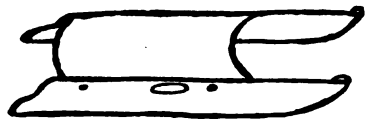
ARITHMETIC

Dept. 1 Job No. 124 Name Fred Dion Div. IIA Date 12-8-16

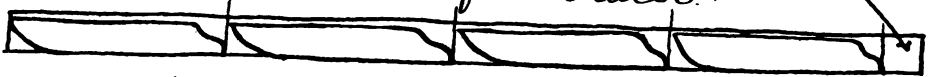
SUBJECT 25 sleds
Tops whitewood
Runners and braces ash.

Material for one sled

2 pcs. $\frac{7}{8}$ " ash 4" w. 3'6" long; runners.
1 pc. $\frac{1}{2}$ " w w 10" w. 3' " top.
2 pcs. $\frac{7}{8}$ " ash $1\frac{1}{2}$ " w 12" " braces.



$3\frac{1}{2}' \times 2 = 7'$; $7' \times 25 = 175'$ lin. for runners.
 $3' \times 1 = 3'$; $3' \times 25 = 75'$ lin. for tops.
 $2' \times 1 = 2'$; $2' \times 25 = 50'$ lin. for braces.



$50 \div 4 = 12\frac{1}{2}$ bds; order 13 bds.
 $12 \times 2' = 24'$ waste from 12 bds.
 $16' - 7' = 9'$ waste from the 13th bd.
 $24' + 9' = 33'$ waste from runners.
 $33' \div 175 = 18\frac{6}{7}\%$ waste from 4" ash.

2' waste ripped = braces.

SAMPLE PROBLEM IN LINEAR FEET AND PERCENTAGE OF WASTE.

include the home making and special activities of the girls as well as the shop activities of the boys.

It is important, however, that the related work be real, and that it be efficiently carried out. All classroom work having some connection with shopwork is not related work. Have we not seen problems

the problems given them in the classroom. The scheme for carrying out the work and the teacher's method failed to establish the relations.

A practical scheme of related work involves six essential factors.

First, a concrete shop experience, typical of real activities and worth relating other

work to, is necessary. Exercises will not serve as typical experiences.

Second, a need on the part of the pupils for doing the related work should be apparent. The related work may involve symbolic expression or the learning and organizing of facts related to the concrete situation. An acknowledgement of the order for the job may be sent, materials

Fourth, the data is formulated. The pupils prepare the work on blanks especially devised for this purpose. There is considerable value in doing this work systematically. The blanks used in the Springfield, Massachusetts, schools were described by Mr. Stratton in the March, 1917, number of this Magazine. Each pupil fills out his proper blanks and takes



WORKING OUT THE RELATED ARITHMETIC.

ordered; shop notes may be prepared for later reference, the cost or a quotation on the job is asked for, quantities, volume, weights may be needed; expansion, pressure or other science principles must be dealt with, or references looked up as to origin, routes of shipment or historical facts.

Third, the shop approach to the related work should be carefully considered. Data for related work should be collected in the shop as the concrete experience develops. To insure regularity of effort, it is well to establish a certain time in the shop session for the collecting of this data. Fifteen or twenty minutes may be taken from each two or three hour session for this purpose.

them to the classroom to serve as the basis for his related work. The shop teacher also fills out a set of blanks with the related work completed and turns these over to the class teacher.

Fifth, steps must be taken in the classroom to keep clearly before the pupils the relation between the shop experience they are having and the particular piece of related work they are doing. Several effective methods for maintaining this relation in the minds of the pupils may be used. A visualization of the particular shop process or operation should be in the pupils' minds while they are doing the related work. The project, or the materials and tools used, may be brought into the

classroom. Some of the operations may be repeated there. Pictures and blackboard sketches are valuable for this purpose. The pupils should be taught to illustrate their

It is enough to receive from principals of schools where this work is carried on, such statements as, "We are getting better English and better arithmetic from these



A PRACTICAL JOB.

English, arithmetic, or science papers with neat sketches. These keep before the pupil the idea of the project or operation to which the classroom work is being related.



CLEANING UP THE SHOP.

Sixth, the related work is checked up by the classroom teacher for the proper forms of expression, and by the shop teacher for the references to fact and to shop practice.

Theoretical claims for the educational value of this related work have little value.

children than we ever did before," or from another, "I know we are doing more for these boys and girls educationally than we were able to do before," and from a third, "These boys show more adaptability and initiative in dealing with problems than boys from other classes."

Of course, successful related work depends on the ability of the shop teacher to "put it over." The shop teacher must have a sympathetic appreciation of the class teacher's problem if he is going to be successful in teaching related work. He should, for a half-year at least, teach all of the related work planned for a selected class, including the shop approach, thru to the completion of the work. He will then appreciate the classroom teacher's problem. After he has served this apprenticeship and has the work organized, he needs to continually confer with the classroom teacher to anticipate new principles she must present, and possibly to plan concrete experiences for the introduction of these new lessons. Also he will

need to keep the classroom teacher posted as to the materials and processes her pupils are occupied with, and to supply her with illustrative material.

It has been frequently stated by classroom teachers that they cannot teach the related work until the pupils have been first drilled in the principles involved, and then they can teach the pupils to apply the principles in the related work. This is giving abstract theory before the concrete

experience. Much time and energy will be saved and more effective teaching will be done if a concrete approach is given to a subject thru a shop and related work experience. The principle involved will then be clearly established and the drill work may follow to give facility.

Most interesting results in classroom work and shopwork are secured when these two parts of the curriculum are combined in a related work scheme.

COOPERATIVE EDUCATION IN THE HYDE PARK HIGH SCHOOL.

JAMES C. CLARKE.

Instructor in Manual Arts, High School, Hyde Park, Mass.

IT was my good fortune to plan and equip a practical shop for metalwork at the Quincy School, Boston, where a special class of about thirty-five boys received prevocational training, and a few were placed in shops, working in pairs on alternate weeks. It is a satisfaction that many of this class found their way into secondary schools, and others became practical men at the trades. One of the latter is now making over thirty dollars a week.

When Hyde Park became a part of Boston, I was transferred to its high school to help in the development of the new co-operative industrial course.

In February, 1913, we visited local industries and placed twenty-two boys in eight different shops, for one afternoon a week, without pay. The experience these boys gained in drafting rooms, machine shops, sheet-metal departments, forge shops, foundries, and woodworking plants, gave them an insight into industrial life.

That fall (1913) the school program was so arranged for the industrial course that the school work came the first three days of the week, and real shopwork, with pay, the last three days. This arrangement was not entirely satisfactory either at school, because the boys came from diffe-

rent grades, or at the shops, which were short-handed the first three days. Too much cannot be said in appreciation of the public spirit shown by the superintendent of the American Tool and Machine Co., the general manager of the B. F. Sturtevant Co., the Becher Milling Machine Co. and others in tolerating these conditions and so freely opening their shops to the boys.

Increasing numbers in the fall of 1914 called for a different plan. The lack of teachers fortunately called for a-week-at-school-and-a-week-in-shop program, with two alternating divisions taught by the same teachers. This was practically the same arrangement that prevailed at the Quincy School. One of the divisions was made up of third and fourth year pupils and the other of second year boys. The course of study, shown on the next page, was prepared by George W. Earle, head master of the high school, in conference with the supervisory staff, and with an advisory committee of manufacturers and technical experts. Immediately after graduation from the high school work of this industrial course, the entire time of the student is given to completing the 7560 hours of shopwork which are required before the diploma can be received.

That the shop end of this work may run smoothly and not be crippled by the lapse of one of the pair of boys in any shop, we have prepared a one-year contract which must be signed by the applicant and

his parent before any shop assignment can be made. This contract, while not legally binding, has kept most of the boys "on the job" for the school year.

This practical course is a boon to several

CO-OPERATIVE INDUSTRIAL COURSE OF STUDY

FIRST YEAR

<i>Subject</i>	<i>Periods</i>	<i>Points</i>
English	5	5
Industrial Mathematics	4	4
Elementary Science	4	3
Bench Work, including Drafting	10	7
Military Drill	2	2
Chorus Singing	1	1
Hygiene	1	1
	<u>27</u>	<u>22</u>

As a part of the regular work, monthly excursions are made to the various manufacturing establishments in Hyde Park. These visits help the pupil to decide upon the trade to be learned.

SECOND YEAR

<i>Subject</i>	<i>Periods</i>	<i>Points</i>
English	5	2½
Industrial Mathematics	5	2½
Industrial Geography	3	1½
Physics	4	2
Drafting (two prepared periods and three unprepared)	5	1½
Bench Work (with prepared work)	2	1
Military Drill	2	1
Chorus Singing or Orchestra	1	½

During every other week the pupil works at his chosen trade in some industrial establishment, receiving the pay of an apprentice.

Diploma points for this work.	10
Total Points	<u>22½</u>

THIRD YEAR

School attendance alternates each week with the work in manufacturing establishments.

English	5	2½
Industrial Mathematics	5	2½
Industrial History	3	1½
Chemistry	4	2
Drafting (two prepared periods and three unprepared)	5	1½
Bench Work (with prepared work)	2	1
Military Drill	2	1
Chorus Singing or Orchestra	1	½
Diploma points for work in the Hyde Park shops on alternate .. weeks		10
Total Points		<u>22½</u>

FOURTH YEAR

School attendance alternates weekly with the work in the shops.

<i>Subject</i>	<i>Periods</i>	<i>Points</i>
English	5	2½
Industrial Mathematics	5	2½
Civil Government	3	1½
Applied Science	4	2
Drafting (two prepared periods and three unprepared)	5	1½
Bench Work (with prepared work)	2	1
Military Drill	2	1
Chorus Singing or Orchestra	1	½
Diploma points for work in the shops on alternate weeks		10
Total Points		22½



AT WORK IN THE FOUNDRY OF THE B. F. STURTEVANT CO.¹

groups of individuals: To parents of limited means who need the financial returns from the shopwork; to motor-minded boys who continue in school because of the relief shopwork gives on alternate weeks; also to boys who cannot afford a higher technical education, yet see a developing future thru evening technical

training after graduating from this co-operative industrial course. Several of our graduates are already in good jobs, and are carrying on advanced technical work. All of the class of 1916 have positions paying from \$18 to \$20 per week. Most of those who left school without graduating, are in the trades for which this course was fitting them.

¹Photographs used in this article were taken by the International News Service, Boston, Mass.

Public spirit and a special interest in this Cooperative Industrial Department

is shown by the personnel of the Advisory Board made up as follows: Henry F. Arnold, superintendent of the American Tool and Machine Co., E. B. Freeman, general manager of the B. F. Sturtevant Co.; Walter B. Russell, director of the

the parents of the first year boys for a conference, and shop conditions are stated as plainly as possible, thus avoiding many lapses. At first several manufacturers were in doubt as to the practical value of our plan. Now, all our twelve shops heartily approve of this course, and are calling for more boys. Mr. Russell, of the Franklin Union, writes in regard to this high school course.

Under Mr. Earle, the teachers of the Hyde Park Cooperative Industrial Course have brought the work thru a most encouraging apprenticeship and have now an unparalleled opportunity for the broadest kind of constructive training.



IN THE MACHINE SHOP OF B. F. STURTEVANT CO.

Franklin Union; George E. Tootill, machinist at the American Tool and Machine Co.; John F. Fox, machinist at B. F. Sturtevant Co.

These busy men have given freely of their time and experience to promoting the welfare of our prospective mechanics. Occasional lunches prepared by the girls of the domestic science course, have brought the manufacturers and school superintendents closer together. Gatherings of fathers and foremen help to a better understanding. Parents and guardians have been conducted thru the shops which were working evenings. That disappointments may not arise from any lack of knowledge of shop conditions, the head master calls



IN THE SHEET-METAL SHOP, B. F. STURTEVANT CO.

In conclusion let it be understood that such a course, desirable as it may be, will not run itself. The nature of its work, with varying conditions, forbid a cut-and-dried program. It must be constantly changing, and unless there exists a hearty cooperation between the school men and

shop manager, failure is sure to follow. The fact that these two distinct factors are working for the development of the boy makes the work of the coordinator most important. He must be a man used to both shop and school methods, able to plead the cause of our coming citizens in either plant, especially in the shops. Here they serve under different foremen and find varying scales of wages. It is to be expected that those in this course, will not receive identical training in the trades. Piece work, and modern productive methods limit a complete knowledge of the

in these experiences, if the jobs are changed with reasonable frequency. A few shops will take a boy to train him for a machine tender, claiming this to be a trade training. The coordinator must transfer



IN THE MACHINE SHOP, B. F. STURTEVANT CO.



IN THE ELECTRICAL DEPARTMENT, B. F. STURTEVANT CO.

trades, but these shops also, can, and must be used by the coordinator, who finds value

worthy boys from such a plant and yet retain the good will of the management. I have had three such successful cases.

Our Boston industrial plants respond to the twentieth century call and are giving the boys a chance to become skilled citizens, recognizing ambition, application and ability with its just reward.

There are individual cases of disappointments, but the type of boy in our cooperative industrial course is much ahead of the average apprentice found in the shops.

No vocational course must be so narrow in aim and scope as to cheat the pupil out of his heritage of race culture and to prevent the making of a living from contributing to the making of a life.—DR. A. F. LANGE.

THE TEACHER OF PRINTING.¹

FRANK E. MATHEWSON.

Director of Technical and Industrial Department, The William L. Dickinson High School,
Jersey City, N. J.

I AM asked to speak concerning the qualifications of the teacher of printing, and because the only difference, as I see it, between the qualifications of a good teacher of printing and the good teacher of any other subject, lies wholly in the mastery of the special subject that the particular person is to teach, I therefore desire to consider somewhat the general qualifications of all teachers, incidentally some things concerning teachers of shopwork, and more especially many things directly relating to teachers of printing.

The necessary qualifications of teachers of shopwork and in fact all teachers of vocational subjects, have been the subject of much discussion among those who must employ such teachers in the public schools, and especially so in those states where certification is required by law; that is, where no person can legally teach and secure compensation for his services from the public treasury unless he hold a current license which can only be secured by passing a written examination prescribed by law. It is not my purpose to take up the question of certification of teachers. If you will obtain a copy of the revised Bulletin No. 19 of the National Society for the Promotion of Industrial Education on "The Selection and Training of Teachers for State-Aided Industrial Schools," you will find all the necessary information you may require concerning the subject.

Now if you look into your "Webster's Unabridged" you will find as the definition of the word "teacher" "one who

teaches" and then looking at the word "teach" you will note these definitions:

TEACH—to show, guide, direct.

to make to know how; to show how; hence, to school, train or accustom to some action.

to direct as an instructor; to guide the studies of, or to conduct thru a course of studies.

to impart the knowledge of; to instruct in the rules, principles or practice of.

to make aware by information, instruction, experience, or the like; to instruct, to cause to know.

The synonyms of teach are:—instruct, inform, inculcate, tell, guide and counsel.

If we keep in mind these definitions of the meaning of the word teach, we may apply them to the qualifications of a shop teacher, and especially to fit the case in hand," the qualifications which you, teachers of printing, should possess in order to properly fill your jobs.

FUNDAMENTAL REQUIREMENTS.

Remember, please, that probably the controlling purpose of the school where you are employed is to fit your pupils for profitable employment as producers in industry. That you, as special teachers of printing, serving in such schools, must possess trade experience and other training adequate in every way to your job, is a fundamental requirement. But I must emphasize, lest you forget, or perhaps do not know, that the industrial school is not merely a simple device for teaching a trade. It is a school dealing with the education of adolescent children.

It has the same responsibilities as any other school which has in charge the edu-

¹Paper presented at the Philadelphia meeting of the Association of Teachers of Printing.

cation of other children of the same age. Like those schools, it must require of its teachers certain qualifications as to personality, education and teaching ability. So then we must consider at least four kinds of qualifications which you will find are decidedly essential for successful teaching service. Let me emphasize them again:

(a) Industrial qualifications; which are, trade knowledge and experience.

(b) Educational qualifications; which are, general school training, technical knowledge of the trade, trade history.

(c) Personal qualifications; which are, appearance, character, health, personality.

(d) Teaching qualifications; which are a knowledge of principles of education, school organization, methods of teaching.

INDUSTRIAL EXPERIENCE.

It is difficult to arrange the classification of these qualifications in proper sequence as to the importance of each. Think of them as the four quarters of a circle all of which are necessary to make the well trained, properly qualified, rounded-out teacher. I will begin with the qualification for which, very largely, you were selected for your job, the qualification of "industrial experience," which is the trade knowledge you possess that is obtained only by doing the operations and processes of your trade.

I wonder just how many teachers of printing are familiar thru actual experience with all the varied processes of the craft, and are actual masters of the trade thru actual work accomplished in even half of its numerous branches. How can you impart proper trade methods to your pupils if you have little or no knowledge concerning these things.

Your business is to show how and to show how in the very best ways known in your craft. To properly teach a trade

you must have lived it, and from your trade experience, bring skill and acquaintance with the best practice in every branch of it. You should have command of its drawing, science, art and mathematics. When you accepted your positions you set yourselves up as being versed in the best practices and methods employed in your trade, and to become a successful teacher you will find that you will be obliged to live up to the reputation you gave yourselves.

GENERAL EDUCATION.

Turning to the second kind of qualification, that of "general education." It is obvious that, at present, most men who are considered masters of their trades from the viewpoint of the trades, are those who in many instances, left school early in life, sometimes from necessity, sometimes from choice, and yet if these men are to become teachers, somewhere and somehow during their period of trade life, they must have acquired thru some form of study, at home, in evening schools, or correspondence courses, enough general education to enable them to properly understand and to express their knowledge both orally and by the written word. They must have a knowledge of the history of their trade, and its development thru important discoveries and inventions.

Think of the wealth of available material at the command of the teacher of printing who thoroly knows or studies the history of his craft. The romance of the discovery of movable types, the vicissitudes of the early printers; the lives of Gutenberg, John Faust and his inventive son-in-law Peter Schoeffer who invented or devised puncheons, matrices and moulds; Laurence Koster, whose native city of Haarlem claims as the real inventor of printing; Nicholas Jensen; William Caxton, who brought printing to England;

his apprentice and successor, Wynken de Worde who so respected his late master that in many of the books printed after Caxton's death gave Caxton credit in the following words:

"And Wynkyn de Worde this hath sett in print. In William Caxtons hows so fyll the case."

and later trying his hand at rhyming, printed this poem:

"For in this world to reckon every thing

Pleasure to man, there is none comparable
As is to read and understanding

In books of wisdom—they ben so delectable,
Which sound to virtue, and ben profitable;
And all that love such virtue ben full glad
Books to renew, and cause them to be made.
And also of your charity call to remembrance

The soul of William Caxton, first printer in
this book

In Latin tongue at Cologne, himself to advance
That every well-disposed man may thereon
look;

And John Tate the younger joy may he
brook,

Which hath late in England made this paper
thin,

That now in our English this book is printed
in.

The many other old craftsmen, too many to mention here, all lend interest to your teaching if properly presented to your classes. Tell them about Bradford and Franklin of early colonial days; Horace Walpole and his private press at Strawberry Hill, and so on down to William Morris and his wonderful work at the Kelmscott Press. The work of De Vinne, Updike, Orr, Goudy, Will Bradley and other master printers of the present are sources of inspiration to the ambitious pupil when the ideals of these men are held up to them. Get your boys to read about the development of the printing press from the huge ungainly wooden structure of the early printers to its more refined type, the old Washington press of our grandfathers, followed by the inven-

tion of the movable roller self-inking press; then the cylinder press and so on down to the magnificent, almost human in action, marvelous newspaper press of to-day, making more impressions in an hour than the old printer could make in a year; the invention of movable types; the difficulties of the early type-founders; the attempts to devise type-setting and type-casting machines which have resulted in the linotype and monotype of modern printing; the gradual changes in printing illustrations, from the crude wood block, the more refined woodcut or engraving, copper and steel plates, and then thru the invention of photography, the introduction of the zinc etching, and the half-tone; followed by the latest development in printing, the offset process which gives such beautiful and artistic results, impossible to obtain in any other way. I could go on almost indefinitely concerning all the things that the printing teacher should be able to use as a part of his teaching equipment. Teachers of printing should have the broadest general education possible for them to obtain. Just think of your responsibility concerning the work turned out in your classroom. Not only are you responsible for the mechanical and typographical excellence of the work produced, but it is your business to see that it is absolutely correct in spelling, punctuation, English and statement of fact. What excuse can you give—you teacher of printing—for a misspelled word, incorrect punctuation or careless use of English?

The stock excuse of the printer, "I followed copy" is not yours. It is your business as a teacher to see that the final proof is correct in every particular, or else, why do you pose as a teacher? In no other kind of work is found the same opportunity for continuous correction until perfection is practically obtained. Why should your pupils produce work that is

ugly to look at because of poor arrangement and careless attention to proper principles of spacing and selection of types?

Why should you assume to be able to do good printing if you know nothing of the first principles of good art such as balance, rhythm and harmony which all good printing must exemplify? I wonder how many teachers of printing have made

most important of all for surely the kind of "personality" one possesses has most to do with his success not only in teaching but in all other matters where success is to be measured.

Here are some of the things that are included in personality:

Appearance	Sociability
Character	Leadership
Health	Executive Ability

In eschewing of ydlenes moder of all vices. I haue delibered in my self for the contemplacion of my sayde re doubtid lady to take this labour in hande by p^r suffraunce and helpe of almyghty gode. whome I mekely supplie to grue me grace to accomplysh the hit to the playfir of her that is auiser therof and that she resceyue hit in gre of me her faithfull trewe & moste humble seruant 209.
Thus endeth the seconde book.

CAXTON'S TYPE NO. 1, 1471.

a careful study of type faces and really know when and where to use them to the best advantage?

How about teaching something of the history of the alphabet in order that your pupils may have some appreciation of the meaning of each letter, its derivation, its construction, its almost personal history? Consider the materials used in your trade. Surely the boy you are training must learn something about the manufacture of paper and inks; of rollers, linecuts, half-tones and electrotypes. Are you able to put together the information you possess and then impart it to your pupils in a most clear and comprehensive manner? It means that you shall be able to do all these things to become a successful teacher.

PERSONALITY.

I am inclined to believe that the next qualification to consider is perhaps the

Again it is difficult to say which of these is the most important. Surely to have a successful personality one must possess them all. The question each of us must ask of himself is this:—"How do I measure up as a man?"

Remember that you must be measured by yourself alone; you, your individuality as shown by your habits, your dress, your language, your character, your attitude toward life and your fellows; yes, even your honesty, your fairness, your sense of justice; all are determining factors in your personality which lead to success as a man and a teacher.

Have you the requisite patience to guide and counsel, to deal wisely with your boys; cooperate with them, win their confidence and arouse their ambitions? Can you at the same time be kind and gentle and yet, under all conditions, trying and otherwise, able always to com-

mand respect and obedience from those sometimes almost incorrigible youngsters in your charge.

TEACHING ABILITY.

Finally, the fourth kind of qualification, "teaching ability," by which I mean if I may so call it, a knowledge of the mechanics of teaching; that is, a knowledge of principles of teaching, and skill in their application to trade instruction.

do-that method without realizing in the least that behind all thoro instruction lies *thought* and *reason why*.

"Showing how" by itself is not industrial training or education, even tho the showing is done by the very finest skilled workman. It must be combined with the most careful explanation, or demonstration, of the mechanical operations in *doing*, employing the sound reasoning and questioning that will develop interest and in-

Thus endeth the booke of Tulle of olde age translated
out of latyn in to frenshe by laurence de primo facto at
the comaundement of the noble pryncce Robtys Duc of
Buxton/and enprinted by me symple persone William
Caxton in to Englysshe at the playfir solace and reue-
rence of men growyng in to olde age the vij day of Au-
gust the yere of our lordz. M. CCC. lxxxj :

CAXTON'S TYPE NO. 2, 1481.

These include a knowledge of or familiarity with industrial school organization and educational principles and theory as related to industrial education. It is essential that as a part of this teaching equipment, the teacher should have knowledge of the economic, social and industrial evolution that has brought about the present movement for industrial education. The teacher should know how to plan his work, for he certainly must have for his own guidance in teaching a definite outline and course of instruction which shall be logical in its sequence, and demand real study and thought concerning the subject on the part of his pupils.

Too many trade-trained men entering the teaching profession, look upon their new work as simply a "show-how process" a sort of a you-do-this-and-then-you-

qu岸 regarding all the underlying theory and principles concerning the work to be done. This is perhaps one of the most important things that the shop-trained man who becomes a teacher has to learn. Much of his work in the trade has become practically automatic because of long experience. He probably learned how to do many things employed in the practice of his craft thru the show-how method and has never given thought to the reason why of the operations involved.

THE REWARD OF TEACHING.

I might continue almost indefinitely concerning the infinite number of details which enter into the qualifications of the good teacher and all that the title should imply to the person who from choice, enters the profession. It is an occupation

that places more demands and responsibilities on the successful teacher than most people realize. It calls for untiring devotion to duty, unlimited patience, oftentimes personal sacrifice; always giving the best that is in you; forever holding up ideals and trying to live them as well, in order that those boys and girls placed in your charge may not only be instructed in the methods and operation of your craft, going from you to become good workmen, but also, more than perhaps you or they realize, thru your example and influence, to become better men and women; upright, honest, loyal citizens of a country where opportunity is limited only by the capacity and ability, mental

and physical limitations of the individual. All this is expected of the teacher, who in return often receives an inadequate salary combined with the insinuation that teachers always have an easy life, made up largely of short hours, holidays and long vacations.

Yet the successful teacher looking back over many years of endeavor reaps greater satisfaction as he reviews his work and sees the results in the lives of those with whom he has had the opportunity to labor, and he knows with joy in his heart that he has had his share in the training of boys and girls who have developed into responsible citizens of the community which employed him for that very purpose.

COMMUNITY SERVICE AND VOCATIONAL TRAINING.

PARKER B. PRATT.

Assistant Principal and Head of Manual Arts Department, High School, Grantsville, Utah.

Last February our attention was called to a letter describing the manual arts work being done in Grantsville, Utah. It seemed to be so typical of the new spirit and method that is coming into the high schools of many communities, especially in the western mountain and coast states, that we asked the privilege of presenting it, with a few photographs, to our readers.

One illustration of Mr. Pratt's method is found in the fact that in March he completed a campaign for cement sidewalks—the first in the town. He was successful in getting orders for building two-and-a-half miles of such walk. Mr. Pratt personally drew up the petitions and circulated them for names of abutting property owners. He says it was easy after the first extension was signed up. As a result of this campaign Mr. Pratt was appointed city engineer.— Editors.

MY aim and purpose in the manual arts work at Grantsville is primarily (a) school, home, and community service; (b) pre-vocational or informational experience; and secondarily, (c) vocational or trade training.

For this reason the first half-year of the junior high school student's effort is devoted to free service to the school. This service covers the making of all wood equipment needed in every department of the high school or the district school; additions, alterations, repairs, painting, staining, varnishing, and sign-writing (all athletic, dramatic, social or other activities are advertised by signs done by the students).

This will appear at first hand a pretty big undertaking. But after nine and a half years of this kind of experience, I am more enthusiastic than ever. However, it may not fit other communities or the personality of many other teachers, who prefer to follow more formalized course or outlines. I am trying to develop the ideal of service, coupled with initiative, industry, resourcefulness, unselfishness, loyalty, and efficiency. A few of my students are carpenters; the rest use their skill as a slack-season means of employment when not busy at their regular work, or to help them thru college or high school.

The other side of the first half-year is that the school employs any or all of my

boys on Saturdays, holidays, after school, or during study periods at \$2.50 for eight hours of labor on any rush projects. The boys receive credit for this work as well; the classes meet daily for one hour and thirty minutes, for which they receive one unit of credit. Of course all absences

around our school buildings; assembling and screwing in place of all school desks; framing of all school pictures; all stage scenery and properties for our annual dramatic performances; good sidewalks and good roads around our grounds; athletic campus; football goal posts, side line



THE SHOP BOYS, GRANTSVILLE HIGH SCHOOL.

are deducted from the extra time they put in in figuring their final units of credit. They may work for themselves after school, study periods, holidays or Saturdays, during the first half-year.

The following suggestive list covers our activities for the first half-year; domestic science tables; chemistry tables; shop tables; art metal tables; chemistry cabinets; drawing tables, lockers, cabinets, and boards; tool lockers and cabinets; bulletin boards; all gymnasium benches, bleachers, the floor itself, lockers, shower rooms, cement floors, spectators gallery; all kindergarten tables; domestic art equipment; biology laboratory outfit in wood; teachers' rest room furniture; cement sidewalks, marching platforms and cement steps

benches, bleachers, grandstands, fences, clean-ups, scoreboards, entrance title over gates; and anything else that may need doing for the school, playgrounds, etc.

This service results in an annual saving to the school of from \$900 to \$1500 in each first half-year of school.

Care must be taken to see that each student gets the experience in all the various steps in skill development and enough repeats to produce skill, but not so much that he loses interest in the work. At the same time it must be kept in mind that certain things are done daily thruout life, of necessity, long after they have ceased to be actively educational.

All of their time is their own in the second half-year. A student gets credit

for all the time he puts in the class, no matter if he enters late or quits before the end of school. It is up to me to produce in each one an aim and interest that will result in efficiency from all.

The second half-year is devoted to home projects, the Board of Education pays for all time during this period that the student devotes to school service. The annual

Davenport couch, Morris rocker, arm rocker, table, foot stool, taboret, piano stool, besides an ironing board and a kitchen table. This was all hand work, as we have no machinery.

A library of four hundred volumes, kept in my own department, made up of all the well known texts, free catalogs, circulars, samples of woods, leathers, etc., molds,



POULTRY HOUSE, BUILT UNDER THE SUPERVISION OF PARKER B. PRATT, GRANTSVILLE, UTAH.

half-yearly product runs in value from \$1500 to \$2500. (It is a good idea to take pictures of this so you can prove your output is what it is. These also become invaluable as aid and spurs to each new class.) Everything in the home, in the community or on the farm that is made of wood serves for projects. The junior high school boys can do anything that older students can do; the difference is in the special methods used in instruction and demonstration, except in those projects where great strength is needed, and even then, a group attack solves the problem. The very best results I have ever obtained was last year from a fourteen-year old boy who was handicapped by nervousness and dislike for school. The last half of last year he made a full set of parlor furniture;

bids from reputable houses on all supplies we use, cost card system and list of stock for thirty "type" articles we make, together with about a thousand blue-prints I have accumulated,—all these help to run this department in an efficient manner.

Now, in conclusion, I don't pretend that this outline is perfect, or that it always works out in accordance with my aims and ideals, but it is a sincere attempt to square results with some definite purpose. Some very heated controversies have resulted here in Utah over this very ideal of service as I have hastily suggested it to you, but after ten years of experience and missionary work, most of the Utah high schools are now emphasizing the above practical problems—of course, modified to fit local conditions.



MODELS OF BOATS, MADE IN WASHINGTON INDUSTRIAL CENTER, SEATTLE.

CORRELATED SHOPWORK.

EDWARD G. ANDERSON.

Teacher in an Industrial School Center, Seattle, Washington.

SHOP teachers realize more than anyone, perhaps, the difficulty of correlating the work of the shop with the academic subjects. There is no doubt as to the value of correlation, but the method of accomplishing the desired results have not been fully determined. As a rule shop men have to work conjointly with women teachers who do not understand shop procedure, thus making the problem more complicated. For this reason any plan that will connect the work of the shops with the academic work without the assistance of an outside teacher simplifies the work of correlation. S. C. Olson, instructor in the industrial center of the Washington school, Seattle, has such a system and five years of

successful operation has established its educational value.

Mr. Olson's problem was to find something that would bring added interest into the shopwork, promote the spirit of co-operation among the boys and correlate shopwork with problems and events outside of the shop. His solution came in interesting his eighth grade boys in a class memorial in the form of a permanent exhibit in which every boy's work was represented. The first project attempted was the study and construction of bridges. The boys brought in all the material they could find descriptive of different types of bridges. This material was thoroly studied, after which each boy chose a type



MODEL REPRESENTING THE LUMBERING INDUSTRY. MADE BY PUPILS OF THE WASHINGTON INDUSTRIAL CENTER, SEATTLE.

he wished to construct in miniature. The result was very successful.

The next year architecture was studied in the same way. The year following the class made an investigation of hoisting machinery, many different types of models being constructed. An illustrated history of boats proved one of the most interesting of the five exhibits. Models dating from the earliest known boat to the modern ocean liner, including such famous boats as the Santa Maria, Mayflower and the Clermont, were in the completed exhibit. An interesting feature of this project was the public launching of the boats in a pond of a city playfield. As each boat was launched the builder told the spectators the history of his particular model. The boys also made their boats the subject of a composition for their language work.

Last year a detailed study of the lumber industry was the chosen project. The study was made under three heads: (1) The camp; (2) the mill; (3) finished products. The boys who studied the camp

made a trip to a logging camp in the mountains during the week of the spring vacation. Here they saw the trees felled, hauled to the skidways and loaded upon the cars for delivery to the mill. They also investigated the working conditions of the men, their rate of pay, etc. These boys on their return to school constructed their part of the exhibit. Another group visited typical saw-mills and illustrated what they saw there, while another group made a study of the uses to which lumber is put, working out model houses and numerous other illustrations very completely.

There can be no question as to the educational value of Mr. Olson's plan. It involves a careful use of hand tools in a great variety of processes. It arouses the boy's interest in constructive problems. It teaches him to look up material for himself and to write descriptive compositions. It connects the activities of the shop with the problems and interests of the outside world in a most natural manner.

Vocational training of the best and most scientific kind has come to stay. Many of the points made against it on the score of materialism are futile. We shall continue to demand that the work shall be genuine and scientific; that it shall not lead to intellectual flabbiness; that the so-called "interest" shall not be a substitute for hard and patient training, and that the point of "relation to life" shall not lead to a lowering of the ideal values of life.

—DR. EDWIN MIMS.

EDITORIAL REVIEW OF THE MONTH

AS THE terrible war progresses, and as the part that the United States is to take in it grows upon our consciousness, we realize the importance of vocational training as never before. We are forced to recognize that this war is being fought by experts—some in the Navy, more in the Army and many more on the farm and in the factory. And among all these the number of experts in mechanical pursuits is very large. There are operators of machine guns and howitzers, automobile trucks and “tanks;” there are aviators and operators of wireless telegraphy; engineers to build bridges and dig trenches; foresters, carpenters, blacksmiths, machinists, electricians, telegraphers, and many more. Never before in the Nation’s history have the experts in mechanical pursuits counted for so much. Never before has the need for vocational training been so imperative.

Dean Russell of Teachers College, New York City, in a recent address to teachers in Baltimore is reported to have said that there are now three great demands upon the public school system: (1) For a thoro system of vocational training; (2) for bringing up a law-abiding citizenship; (3) for the development of patriotic Americans. It is significant that vocational training is the first to be named.

PROFESSOR CRAWSHAW GOES INTO WAR WORK.

ONE of the important appointments of the past month is that of Professor Fred D. Crawshaw of the University of Wisconsin as president of the Academic Board of the United States Army School of Aeronautics at the University of Illinois. The University of Wisconsin has allowed Professor Crawshaw a leave of absence for one year to do this important work. He will be the executive officer in charge of technical instruction. The Government has established six such schools—one each

at the Massachusetts Institute of Technology, Cornell University, Ohio State University, University of Illinois, University of Texas and University of California.

HARVARD UNIVERSITY TAKES OVER THE VOCATION BUREAU OF BOSTON.

THE war has brought about many important educational changes. Meyer Bloomfield is serving the United States Shipping Board, dealing with the labor problems of ship building, and Harvard University has taken over the Vocation Bureau of Boston of which Mr. Bloomfield has been the director for eight years. Under the new title “Bureau of Vocational Guidance” the work will go forward conducted by a committee composed of the staff of the Division of Education and two members of the faculty of the School of Business Administration. Roy W. Kelly, instructor in vocational guidance in the Graduate School is the new director and Frederick J. Allen is associate director and lecturer in the University.

The Harvard Bureau will maintain all the important activities of the former work and add such as it may be able to attempt under new auspices and enlarged support. It now has the following definite aims:

To carry on occupational research and to publish material giving information concerning occupations.

To continue to promote the movement for vocational guidance and to serve as a center of information on vocational guidance.

To give personal counsel regarding the problems of choosing, preparing for, and entering on a vocation.

To conduct investigations in schools or other institutions, in various lines of business, and in the industries, with a view to determine the need and suggest plans for vocational guidance.

To train vocational counselors for service in schools, in institutions, and in employment departments.

To continue, so far as opportunity may offer, the cooperation, begun by the Bureau thru its connection with employment managers' associations, in solving vocational guidance problems.

To aid and cooperate with other vocational guidance organizations.

To be of individual and public service in dealing with the questions of vocational guidance arising from the present war.

NEW INDUSTRIAL EDUCATION DEMANDS IN ENGLAND

WAR conditions seem to be forcing along new educational measures in England. The Workers' Education Association, which has the united support of the trade unions of England, has passed resolutions looking directly to a system of public industrial education which, if carried into effect, might prove to be a fair offset for the German system of continuation schools. This Association recommends part-time education between the age of exemption from compulsory half-time attendance in the elementary school and the age of eighteen. It demands,

(a) That compulsory part-time education of not less than 20 hours per week (including time spent in organized games and school meals) be provided free for all such young persons as are not receiving full-time education.

(b) That the hours of labor for all young persons under the age of eighteen be limited to a maximum of twenty-five per week.

(c) That the distribution of hours thruout the year upon the above basis should be arranged, where necessary, to meet the needs of seasonal industries and other circumstances.

(d) That the education in such schools, should be directed solely towards the full development of the bodies, minds, and characters of the pupils; that it should therefore be intimately related to the environment and interests of the pupils, and should contain ample provision for physical well-being, including organized games and school meals;

(e) That the teachers in such schools should enjoy status and emoluments similar to those of teachers in other secondary schools.

We wonder if the war will bring large

groups of men in America to recommend such a program. Is it too idealistic to say that any boy who cannot go to school all day till he is eighteen should go at least half a day? Is not twenty-five hours of productive labor on the average all we ought to take from a boy before he is eighteen, provided, of course, that he can be in school twenty hours?

From the American standpoint the fourth paragraph would seem to omit one vital element in both German and recent American education. It omits all technical studies and seems to place no premium on keeping a strong bond of connection between the "hours of labor" and the hours in school. It seems to divorce the two, whereas, we would seek to bind them inseparably. This is evidently due to a desire on the part of the labor leaders to secure for their children, "not vocational education, but the same kind of intellectual and spiritual training which those in a more fortunate position are accustomed to expect." We think this is a mistake. When the problem of education is seen in the large, as a great national issue, the economic and vocational are not antagonistic to the scientific and cultural. Science and art, theory and practice, training and culture, must be united in any scheme that is national in its reach and deserves public support. It is evident that some Englishmen—probably many—look upon it as a mistake. At a conference on "Secondary Education in Relation to Practical Needs" held at Exeter on June 15th Sir William Mather, according to the *London Times*, referred to the neglect of secondary education in England and Wales, and deplored the fact that the spread of technical education among the working classes had been greatly retarded.

We welcome the proposition that it is only fair that every boy should spend at least an average of twenty hours a week in

school from the time he gets his work certificate until he is eighteen years of age.

REQUIRES MODERN TRAINING

THE Government is calling for more recruits for the air service, and here is a list of the qualifications demanded:

The army aviator must master the theory of flight, principles of engine construction, its control and operation, and use of wireless telegraphy, use of a camera while flying, the machine gun and bomb thrower. But the personal qualifications of a good mind, sound body, and accuracy and alertness to observation should be prerequisites to training as they are to successful service.

Here is where the modern school with its practical courses in the industrial arts is an essential foundation.

A practical knowledge of science, intimate acquaintance and insight as regards mechanism, alertness and effectiveness in action are what count. The most modern weapon of war takes a modern man to operate it, and it requires a modern school to train such a modern man.

THE JUNIOR HIGH SCHOOL SYSTEM OF CLEVELAND.

THE junior high school is the all-absorbing educational problem in Cleveland at the present time. Incidentally the attempts to solve this problem will affect the elementary schools below and the high schools above. The problem is therefore being considered very seriously. Cleveland now has nine junior high schools with an attendance of about 4,500 boys and girls. Other Junior high schools will be opened as soon as conditions will permit. Three new buildings, specially designed for junior high school work, each accommodating about 1,200, are to be built in the near future if the people of Cleveland authorize, at the next election, a bond issue which has been voted by the Board of Education.

Committees are at work upon a detailed course of study which will require several months in the working out. Tentatively, the industrial work for boys includes mechanical drawing, woodwork, concrete, printing, bookbinding, metalwork, electrical work, and cabinet making; and for the girls, various types of work in domestic science and domestic art.

Much of the work in the industrial courses will be productive in character, contributing to the service of the schools. All children in these schools will have four fifty-minute periods of industrial work each week. Those electing the industrial courses at the middle of the seventh year will have a minimum of ten periods each week, possibly more, in the final working out of the course of study. All the courses mentioned above are now in operation except concrete and electrical work, altho not all are given in all the schools. It is expected that eventually the work of the junior high schools will absorb the work of the present elementary industrial schools as well as the work of the seventh and eighth grade manual training centers. Incidentally, trade schools are contemplated, but as yet without definite plans. This is a large program, and one that will take a long time to work out to completeness. It is evident, however, that the problem is being attacked with enthusiasm and great earnestness on the part of all concerned.

EMERGENCY COURSES OF INSTRUCTION IN MILITARY ENGINEERING.

THROUGH the courtesy of Arthur L. Williston, director, we are able to present two photographs illustrating interesting phases of emergency courses offered to enlisted men at Wentworth Institute, Boston, Mass. The regiment taking such courses has been divided into a number of different details, according to the ability and practical experience of the individual man. Each detail has been



TRENCH DRAINAGE—EMERGENCY COURSES IN MILITARY ENGINEERING,
WENTWORTH INSTITUTE. BOSTON, MASS.

drilled and disciplined in the branches that seemed most valuable and important to the engineer officers of the regiment.

The short unit courses planned and carried out for these enlisted men include the following:

- Mapping and surveying
- Topographical sketching and map reading
- Gasoline engine operation, repair and maintenance
- Portable steam power plant construction and operation
- Electrical power plant operation
- Field telephony, electric line construction and maintenance
- Timber construction; including pontoons, timber trusses, timber suspension bridge construction, machine gun shelters, dugouts, dug out tunnelling, framing, etc.
- Strength of materials
- Concrete construction; culverts, bridge abutments, gun carriage and engine foundations
- Acetylene welding and demolition work

- Thermit welding and emergency repair
- Machinery erection and alignment
- Forging, hardening, and tempering
- Hydraulics and drainage; especially trench drainage
- Rigging

DEVELOPMENT OF IMAGINATION

AN editorial in a recent number of a technical journal, commenting on the inability of mechanics to adapt themselves readily to changed conditions in industry, expresses the opinion that this inability is due more to subjective causes, such as lack of self-confidence, or overestimate of the difficulty of operating a new machine, than to any real difficulties, such as lack of skill or complexity of the new processes to be mastered. The suggested solution is the "education of workmen, or better still, of boys who are to

become workmen, to have confidence in their ability to run any machine. Inability is due to failure to understand the fundamentals and to lack of imagination."

Thoro grounding in fundamentals has always been at least a theoretical aim in school shopwork. Imagination has not

the conclusion of the course most of the boys are still beginners practically.

Nevertheless, if a teacher is to develop imagination and adaptability in his pupils, he must needs be himself reasonably imaginative and adaptable. The teacher acquires adaptability by meeting and solv-



BUILDING A SUSPENSION BRIDGE—EMERGENCY COURSES IN MILITARY ENGINEERING, WENTWORTH INSTITUTE, BOSTON, MASS.

received so much attention. Carefully analyzed sequence of tool processes and carefully prescribed methods of procedure and technic are essential in the early stages of instruction in any craft. The development of imagination and adaptability can only come in the later stages, after some skill and power of achievement have been acquired by the pupil.

Many shop teachers will plead guilty to the charge that they have accomplished little in the development of these desirable higher qualities. Too frequently they have allowed this aim to be smothered under the pressure of the day's work or the diversions of exhibits and displays, but the fundamental reason has been that under ordinary public school conditions there are no "later stages." The amount of time allowed is so short that even at

ing a variety of difficult situations without detailed assistance from others. Perhaps pupils would profit by a certain number of experiences of this type.

SEEING THE BLIND-ALLEY JOB FROM A NEW ANGLE

MISS Elnora E. Thomson, superintendent of the Illinois Society for Mental Hygiene, Hull House, Chicago, says "There are a lot of blind-alley minds that need blind-alley jobs. We have been saying much against blind-alley jobs without knowing why they were bad." For some they are a great boon.

Miss Thomson is finding that the workshop has an important place in social work with the mentally handicapped, and that a blind-alley job may lead discouraged souls to joy in labor, to self-support and to a new hold on life generally.

WASHINGTON CORRESPONDENCE.

MUCH important work was accomplished by the Federal Board for Vocational Education during the month of September. Following the series of conferences in the latter part of August with the representatives of the state boards, the Federal Board was confronted with the enormous task of analyzing and digesting the voluminous stenographic reports of these conferences while its own organization was still far from being perfected. It was regarded as of the utmost importance that the essential guiding principles of procedure be determined upon as soon as possible, and definite announcement made, so that the states could inaugurate the work this fall with some assurance that their plans complied with federal requirements. The first quarter of the fiscal year ended September 30, and there was some question as to the status of the first quarterly payment due any state in case its plan had not been perfected and approved by the Federal Board before that date.

Upon the advice of counsel that tentative or partial approval may be given, when necessary, and final approval and certification to the Secretary of the Treasury deferred until after October 1 without prejudice, it was decided to provide for a more deliberate examination of the state plans than was at first thought possible.

ORGANIZATION OF STAFF OF FEDERAL BOARD.

ACCORDINGLY, attention has been given to perfecting the organization of the staff of the Federal Board, and persons who are familiar with the leisurely way in which public business is often transacted will be gratified at the progress that has been made in this direction. The list of positions provided for in the staff is as follows:

Director.

Assistant directors, 5; agricultural education, industrial education, commercial education, home economics, research.

Field agents, 14; agricultural education, 6; industrial education, 6; home economics, 2.

Special agents for research, 2.

Legal adviser. Secretary to director.

Chief clerk. Stenographer and linguist.

Editor. Stenographers, 13.

Librarian. Clerk of mails and files.

Disbursing officer. Telephone operator.

Bookkeeper. Messengers, 2.

Total, 47.

By October 1 the director had been on the job only six weeks, and yet all of these positions had been filled except the following: assistant director for commercial education, three field agents in agricultural education and two in industrial education, secretary to the director, and one stenographer for each of the five regional offices.

PLAN FOR REGIONAL OFFICES ADOPTED.

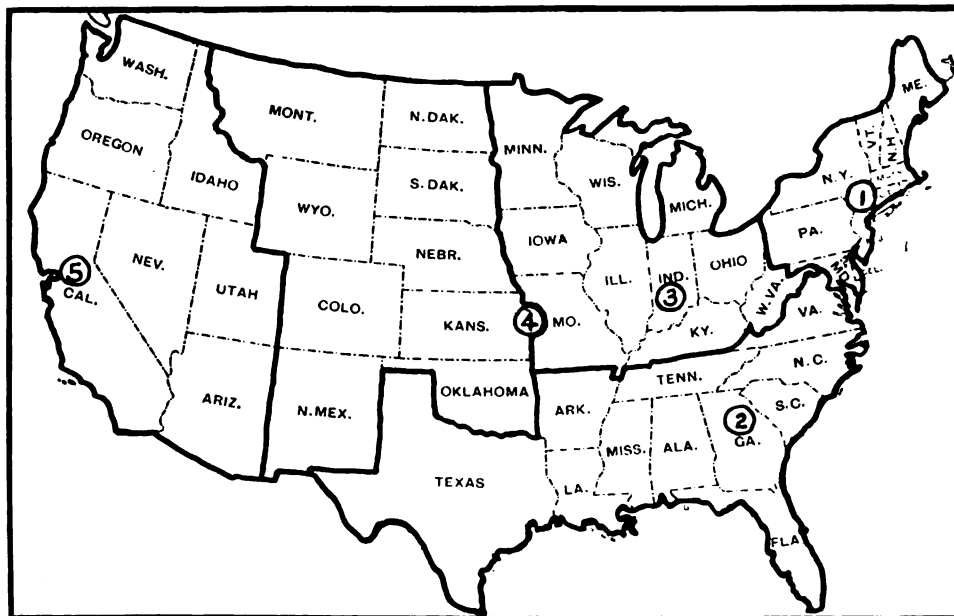
THE states have been divided into five districts, as shown in Figure 1, for convenience in administration. The districts, with the cities designated as headquarters and the names of the field agents thus far appointed, are as follows:

District 1, headquarters at New York City; agents to be appointed.

District 2, headquarters at Atlanta, Ga.; agricultural education, C. H. Lane, transferred from the Department of Agriculture, industrial education, Roy Dimmitt, formerly inspector of secondary schools and secretary to the State Board of Examiners, Montgomery, Ala.

District 3, headquarters at Indianapolis; agricultural education, J. A. Linke, formerly assistant in State Boys and Girls Club Work, Indiana; industrial education, Robert J. Leonard, formerly professor of industrial education, Indiana State University, Bloomington, Ind.

District 4, headquarters at Kansas City, Mo.; agricultural education, agent to be appointed; industrial education, J. C. Wright, formerly director of industrial education, public schools, Kansas City, Mo.



MAP SHOWING DISTRICTS FOR FIELD AGENTS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

District 5, headquarters at San Francisco; agricultural education, W. G. Hummel, formerly associate professor of agricultural education, University of California, Berkeley, Calif.; industrial education, Ben W. Johnson, formerly director of industrial education, public schools, Seattle, Washington.

Two field agents in home economics, with headquarters at Washington, have been appointed; Miss Alice M. Loomis, formerly head of the department of home economics, University of Nebraska, and Miss Anna E. Richardson, who formerly occupied a similar position at the University of Texas.

Other appointments include special agents for research, Dr. John Cummings, of the U. S. Census Bureau, and Miss Elizabeth G. Upham, of Milwaukee-Downer College, Milwaukee, Wis., legal adviser, Daniel J. Richardson; disbursing officer, Henry F. Dolan; bookkeeper, J. F. Little.

All of the field agents were called to Washington for an important series of conferences beginning October 1 and last-

ing about ten days. At this time the field agents were given definite assignments and instructions as to their duties and responsibilities.

ANNOUNCEMENT OF POLICIES.

THE Federal Board has prepared for publication a tentative statement of policies governing the administration of the Smith-Hughes Act. It is expected that copies of this statement in pamphlet form will be available at an early date for the information of state boards and others interested. The following paragraphs constitute a digest of one section of this report.

1. *State Boards as Trustees.*—The state boards are not only agents for the states in carrying on work in vocational education, but also trustees of Federal moneys. As such they are responsible to the Federal Government, thru the Federal Board, for the proper expenditure of such funds in conformity with plans submitted by the states and approved by the Federal Board.

The relationship between the Federal Board and the state board is that of cooperation. It

is understood that the federal funds will be sent continuously from year to year for the support of the joint enterprise as long as the state observes the terms of the cooperative agreement.

2. *Fundamental Aims of Federal Aid.*—The Federal Board is of the opinion that Federal aid is designed (a) to stimulate the states to undertake a new and needed form of service (vocational education) which the national Government believes necessary to the public welfare; (b) to equalize, in part at least, the inequalities of burden among the states in carrying on this service; (c) to purchase for the national Government a reasonable degree of participation in the carrying on of this work in which the national Government is so deeply concerned; and (d) establish standards of efficiency in vocational education, and to set up minimums below which work in vocational education for which reimbursement from Federal moneys is desired cannot be allowed to fall.

The question must always be met in determining whether a state is entitled to share in the distribution of Federal funds. Is the plan proposed by the state one which the Federal Government is willing to accept? Will, or can, the state properly carry out the plan after agreement is made?

3. *Conditions Upon Which Granted.*—The grant, for certain objects specified in the law, is made in accordance with the terms of a definite plan by the state and approved by the Federal Board. No money belongs to any state or to any community as of right. A state is entitled to receive Federal aid only when it has conformed to the Act and has had its plan approved, and a community or institution is entitled to receive aid only when it shows itself able and ready to meet the requirements of the state board.

4. *Efficient Use of Funds.*—State boards should exercise great discretion in selecting schools which are to share in the funds and in determining the amounts to be allotted to each, in order to insure that Federal funds are used only in reimbursing for efficient work. There are grave difficulties involved in distributing the money among a large number of schools in such small amounts as to be quite ineffective in securing the results aimed at.

5. *Method of Reimbursement.*—After a careful study of the plans submitted by the states the Federal Board will decide in each case

whether preliminary approval may be given. If so, the Board will certify to the Secretary of the Treasury that the state has complied with the provisions of the Act for the current fiscal year. This will insure to states whose plans have been thus approved the first quarterly instalment at an early date. As soon as practicable, the Board will assure itself further that the several states thus certified are using the Federal funds in accordance with the terms of the Act. Should such inquiry disclose in any case that this is not being done, the right is reserved to exercise the power conferred in Section 16 to withhold further grant.

6. *Institutions Receiving Federal Funds.*—In the case of any institution receiving Federal aid thru the state board, the Federal Board must be assured (a) that the institution is legally qualified under the Act, (b) that the state board maintains proper supervision, inspection, and control, and (c) that the courses offered are carried on in conformity with the plan as agreed upon between the Federal Board and the state board.

7. *Absolute Standards.*—The Federal Board may not exercise discretion in administering mandatory provisions of the Act; such as, the provision of at least six months of directed or supervised practice in agriculture, or the provision that instruction in the trades and industries for persons who have not entered upon employment must extend over not less than nine months in the year and for not less than 30 hours per week.

8. *Discretionary Standards.*—Concerning provisions where discretion and interpretation are allowed, the Federal Board reserves the right to judge the arrangement made with each state in the light of local conditions, keeping in mind the fact that standards in every state must be progressive, and that no standard can be permitted to fall below a reasonable minimum of efficiency.

9. *Persons for Whom Vocational Education is Intended.*—The Federal Board emphasizes the fact that the schools and classes fostered under the Smith-Hughes Act are for the clearly avowed purpose of giving thoro vocational instruction to healthy, normal individuals, to the end that they may be prepared for profitable and efficient employment, and not for the purpose of giving instruction to backward, deficient, incorrigible, or otherwise subnormal individuals.

10. *Nature of Agreement.*—It is regarded as impracticable as well as undesirable to set up a uniform plan for all parts of this widely diversified country with its differing social, economic, and industrial conditions. It should be emphasized that the plan for cooperation is proposed by a state board for a state, and is approved by the Federal Board for that state.

11. *Relations with State Boards Only.*—Agents of the Federal Board will deal officially only with the state boards and their recognized agents, not with individual schools and institutions. The Federal Board reserves the right to inspect any school in order to determine whether or not the state is carrying out properly the plan agreed upon. It is not intended to preclude the giving of advice to schools by the Federal Board or its agents at the request of the state board or its agents.

12. *Agreement for One Year Only.*—It is highly desirable that the state propose plans for using the Federal money for one fiscal year only. In this way they will be able from year to year to improve their plans and standards so as to conform to the development of the work and to conditions in the states and communities.

13. *Studies and Investigations.*—In accordance with the provisions of Section 6, the Federal Board proposes to aid the states by means of studies and investigations made thru its research department. Bulletins, circulars, and announcements will be issued from time to time. It will undertake to answer specific inquiries from the state boards, and welcomes suggestions as to studies and investigations that will be beneficial to the several states.

14. *Supervision.*—Good teachers and good supervisors are absolutely indispensable in effective vocational education, particularly at the present time. The Federal Board, therefore, urges the state boards to provide for supervision and inspection and to make them as extensive and thoro as possible.

15. *Standards for Plant and Equipment.*—Until definite standards can be formulated with reference to plant, equipment, and maintenance, the Federal Board will for the present hold the state boards responsible only for determining that the plant and equipment in the case of any school or class are adequate to car-

ry out the purposes for which the school is established, and that the amount expended for maintenance is sufficient to insure reasonable standards of work and to secure teachers who are properly prepared to do that work.

VOCATIONAL RE-EDUCATION OF CRIPPLED SOLDIERS AND SAILORS.

ONE of the acute problems arising out of the great world war is that of the rehabilitation and return to social and economic life of soldiers and sailors who have become blind, deaf, crippled, or maimed in various degrees. For the study and solution of this problem there has been created the more or less technical term of "vocational re-education."

It has been decided that this is to be the first major study of the research department of the Federal Board for Vocational Education, under the direction of Charles H. Winslow. The study is to be made in cooperation with the War Department, which is to be represented by a committee of officers from the staff of the Surgeon General, assisted by two specialists in vocational education, Wilson H. Henderson, Extension Division, University of Wisconsin, and M. W. Murray, director of industrial education, public schools, Newtonville, Mass. The two last named have been mustered into the service with the rank of major, with headquarters in Washington where they reported for duty early in October.

The interested reader will find a most illuminating account of certain of the elements involved in this problem of vocational re-education in "Social Forces in War Time," by Dr. Edward T. Devine, in *The Survey* for September 29, 1917, pp. 566-9.

OPEN QUESTIONS

"There is more to be said on this subject."

HERE is a question that surely deserves an answer—many of them. There ought to be a dozen men of experience in the country who would be glad to help out this young man who is just now discovering how far from ideal the teaching conditions may be, even in a progressive Western town where the citizens take pride in their schools and are glad to support them liberally.

MANY KINDS OF WORK OR FEW?

Mr. Editor:

I am teaching woodworking and mechanical drawing in a prosperous, up-to-date, growing town of about 5,000 inhabitants in the center of a county, mainly devoted to farming and grazing. Next year we expect to have a new school building and establish junior high school work. The school board is willing to purchase all needed equipment.

Up to the present time the manual training in the schools of the town has consisted of benchwork from the seventh grade thru the second year of the high school, and a half year of mechanical drawing as a prerequisite to the last year of woodworking. Students are allowed to select their subjects to a large extent in the high school and there they are required to take their manual training *whenever they do not have anything else*. As a result of this I have twenty high school students coming in and going out of my room during the day from 9 o'clock to 4:30 I cannot get them all, or even a large proportion of them at any one time. The students are ambitious, and do very creditable work. Keeping up interest in the work is the least of my troubles, but manual training has merely an excuse for existing here; it is not considered very essential.

I need suggestions from teachers who have had more experience. Considering the school conditions and the attitude of the school board, what changes should be made when the new junior high school opens? Should we offer a greater number of lines of work? Would you advocate carpentry, metalwork, and concrete work, or what? Is it not desirable that the teacher have a fixed time in his program for

each branch of the work, and require the students to adjust themselves to that program, instead of having the teacher adjust his work to each individual student's program?

—H. A. H.

A BEATEN PATH TO HIS DOOR.

Mr. Editor:

Where in the writings of Emerson did the following quotation appear?

"If a man make a better mousetrap than his neighbor, tho he build his house in the woods, the world will make a beaten path to his door."

The following reply to the above question is furnished by Miss Louise Booth, reference librarian, Peoria Public Library:

The quotation, as we know it, occurred in a sermon preached by Dr. John Paxton, pastor of the West Presbyterian Church, New York City, from 1882-1893. The exact quotation is as follows: "If a man write a better book, preach a better sermon, or make a better mousetrap than his neighbor, tho he build his house in the woods, the world will make a beaten path to his door."

The idea in the foregoing was borrowed from Emerson, since the following appears in Emerson's Journals, Volume VIII, page 528, and reads as follows: "I trust a good deal to common fame, as we all must. If a man has good corn, or wood, or boards, or pigs to sell, or can make better chairs, or knives, crucibles, or church organs, than anybody else, you will find a broad hard beaten road to his house, though it be in the woods."

PROPORTIONS OF JOINTS.

Dear sir:

Replying to the request of Mr. Edmunds in your September number, may I offer a few suggestions regarding the proportions of the mortise-and-tenon joint? In general I agree with your other correspondents that no fixed rule can be laid down regulating the proportions of joints, since these must be modified to suit so many and so varied conditions. The rule that a joint shall be so proportioned that the parts joined shall be weakened as little as possible

is sound, but it lacks definiteness. It is merely the rule of common sense.

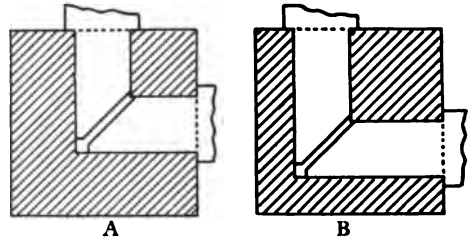
There is, however, a tolerably rigid rule used in the framing of buildings, viz., that the thickness of the tenon shall be one-third the thickness of the timber. A 2-inch tenon on a 6-inch beam, for example, would afford as much strength in that timber as could be obtained without unduly weakening the post by a larger mortise. Since mortises are cut thru in this work it will be seen that the timber is considerably weakened thereby in any case. The width of the tenon is generally the full width of the beam, and its length, of course, is determined by the width of the mortised piece.

In cabinet making conditions are very different. Take, for example, the framing of a door from stock $\frac{3}{4}$ inch thick. To apply the builder's rule here would make a very weak tenon as well as a very vulgar fraction. The tenon on the rail is reduced in width by the groove or rabbet on the inside and by the relish on the outside, and it is limited in length by the fact that the mortise is blind, so we must compensate by giving it as much thickness as practicable. The stile gains (as compared with the timber joint) where the rail loosens. It is not mortised thru nor is the mortise cut the full width of the rail, and for these reasons, added to the fact that the whole joint is made solid by the use of glue, we can afford to enlarge the mortise somewhat at the expense of the thickness of the cheeks. It is, of course, desirable to have the thickness of the panel equal to that of the tenon, thus making the groove coincide with the mortise. My own custom is to make the tenon on $\frac{3}{4}$ -inch stock not less than $\frac{3}{8}$ -inch thick. But I would hesitate to call this a *rule*.

I am aware that machine-made doors are often mortised about one-third the thickness of the stock. I know also that many machine-made doors have no mortise or tenon whatever, because it is easier, and therefore cheaper, to make them that way, but such doors are a wretched makeshift. The rules for cheapness are not the rules for strength.

Mr. Schmidt speaks of the mortises in the leg of a table meeting in the center. This, if meant literally, is poor practice. The mortises should meet, but not in the center. A glance at the accompanying sketch will show this clearly. At A the mortise is laid out equally distant from the inside and outside surfaces of the leg, i. e., centrally; at B it is outside of the

center. In the latter example not only is the leg much stronger and the tenon longer, but there is room for blocking, which is quite essential in a good table frame.



The tabulation of the correct proportions of the mortise-and-tenon joint under all possible conditions would be a very difficult matter, and there would seem to be no more reason for it than for an elaborate set of rules for the size, number and spacing of nails in the side of a box, or the sizes of hinges for doors of given dimensions. Such questions are determined by the judgment of the worker. Present such a set of rules to a cabinet-maker or carpenter of experience and he will use it, no doubt—to light his pipe.—W. F. VROOM, New York City.

VERTICAL OR SLOPING LETTERS.

Dear Editor:

In answer to the inquiry of L. F. in the September number in regard to the choice between vertical and slant letters, under most conditions slant letters allow a more convenient and natural movement of the hand. The variation in the slant of three lines, all of which have a general direction a little to the right of the vertical, is not as noticeable as the variation in the slant of similar lines, one of which is vertical, one slanting a little to the left and one a little to the right. The latter condition is apt to occur in teaching vertical letters.

Willman, Minn.

—ED. R. BENDER

Mr. Editor:

Just a word in reply to the question of Mr. F. Teach the slope lettering. It is the more commonly used. There are so many vertical lines on a drawing with which to compare the vertical lettering that such lettering looks badly unless excellently done. In any case, whichever is taught, stick to one or the other, don't teach both unless you want drawings handed to you later with the two systems indiscriminately mixed.—JOHN E. DOREN,

Technical High School,
Oakland, California.

Editor of *Open Questions*:

Replying to "L. F." who in the September issue asks for help in regard to "Which and Why" in teaching lettering to seventh and eighth grade classes.

"He who hesitates is lost." L. F. has been relying on books. He has found that many books give both the vertical letters and the sloping letters and he has looked in vain, it seems, for some book to tell him which and why. L. F. also sends up that old time wail of "I do not have time." This calls to my mind the fable of the pendulum of the farmer's clock who became discouraged when he found that he had to wag 60 times in a minute, 3,600 times in an hour, and 86,400 times in each 24 hours. After a lengthy dialogue the hands, who were quick at figures, set the pendulum right by showing him that even tho he had to do all these swings in 24 hours he was only required to make one stroke or swing in one second.

A few years ago—about twenty—a professor had the task of teaching me History of Education, principles of education, theory and practice of teaching. He knew that he could only have me for two years. He also knew that he could not teach me *all* that is to be taught in any one of these subjects. He did not throw up his hands and ask which he should teach. He knew that each was essential to my future success and he taught me, as best he could, the elements and fundamental principles of each.

If I had those boys for only one hour in their school life and was supposed to teach them lettering I would teach them all I could of the essential principles of lettering and finish the lesson in full faith that the next teacher would take the matter up at the point I left them and go on to complete success.

Since reading the question as propounded by L. F. I have made a point of examining a great many blueprints that have been put out by different architects and draftsmen on actual plans and specifications for workmen to follow. I am unable to say which predominates. Some use both the slant and the vertical letters on the same plate; some use only vertical letters at all times; some use only slant letters at all times. I should use both styles on a plate if there were occasion for details, etc., on the plans or plate. I would make the legend in

vertical letters and the details, dimensions, etc., in the slant letters.

Why? Because I can do it in less time. Second, because a slight inclination from the vertical shows very badly in a set of words that are made in the vertical.

My advice to L. F. is: Teach both vertical and slant letters to your classes if you teach them lettering at all.

In reply to the Why I would say: Because they are only made acquainted with the elements of one principle if you teach only one form. L. F. may get some light on his problem if he will reason from his experience in spelling and ask himself the question why teach oral and written spelling, or why learn the printed form of letters and also the script.

—FRANK H. SHEPHERD,

State Agricultural College,
Corvallis, Oregon.

TEXTBOOK INDIGESTION.

AN ANSWER TO MR. F.

Mr Editor:

Whenever the question, "what to teach," is raised, it never fails to arouse in me a feeling of sympathy, for the individual who is "up against it." We have all been there, and, what is more, if we mean to keep on growing—to be constantly doing new things, we are bound to meet many more times in the course of our work the little old boat with the same old name. Searching for the truth, I take it is a sure sign of promise for him who would know the right from the wrong.

The severest indictment that has been and still is served upon the teachers of industrial subjects to-day, is the charge that we are not "putting across the real stuff." The standards set up for us to meet nowadays, are the standards of the commercially practical, and meet them we must or stand ready to hear the verdict of "guilty" pronounced. The problem of teaching lettering—what, and how it should be taught—presents a situation which unless we are very careful, will bring down upon our heads, and justly so, the wrath of the practical world, which is, of necessity, to be our judge.

It is not so much a question of "Should I teach vertical or sloping letters?" for in good commercial drafting-room practice both styles of lettering are used. To the teacher who has

not enjoyed the opportunity of a journeyman's training and experience, there is confronting him the danger that so many are heir to, and that is the danger of textbook indigestion. By that I mean, that if a textbook is used in the teaching of a shop subject and it prescribes the teaching to both this and that or this or that, there are those who will take it for granted that the last word has been written on the subject. Too many forget that textbooks are not written for the purpose of being swallowed *in toto*, but rather to be used with discretion as references and guides.

If mechanical drawing is to be taught in the schools, whether it be in the grammar grades or the higher grades—whether for so-called cultural purpose or for practical reasons, it should be taught in a manner acceptable to good shop practice. Since good shop practice accepts both vertical and sloping letters, the thing for the teacher in any community to do, is not to blindly follow what his textbook decrees, but rather to seek the advice of those practical draughtsmen in his community, who when the first opportunity presents itself, are bound to be his severest critics.

Every drafting room in the country has its own particular way of having things done. It would be an extremely difficult task for one to attempt to determine shop standards and conventions that could be applied with equal satisfaction in every drafting room in the United States. The saying, "There's more than one way of killing a cat," surely holds good in this instance.

Therefore I would suggest that Mr. F. visit the drafting rooms in his neighborhood and find out what and how they are doing the things he is undecided about, and then act in accordance with their practice. If we are to get a nod of approval from the practical world for the work we shop teachers are doing, we must convince them that what we are doing is technically correct. It is to our advantage and particularly to the pupils' advantage that we practice the closest possible correlation between the school and the shop, which in all probability, will draw its future employes from the very boys we now have under our care.

—WALTER R. REISNER,
State Normal and Training School,
Oswego, New York.

TEACHING FRACTIONS IN THE SHOP.

To Editor of *Open Questions*:

I have been much interested in your department during the past year, and especially in the discussion on the teaching of fractions in the shop. Since I spent several years as a teacher of manual training in the grades, I may be able to contribute something which will be of assistance to those confronted by this problem.

In the first place, while whole classes may be found which are quite deficient in the handling of fractions, due to poor teaching, the trouble is usually with individual members. In such cases the shop teacher has an opportunity to demonstrate the value of manual training as a method in teaching arithmetic, for where a boy has failed in mastering fractions, the common cause is lack of interest arising from inadequate practical application of the principles involved. The manual training shop furnishes an ideal opportunity for the desired application. Then, frequently a boy is able to work the problems encountered with paper and pencil, but becomes confused when he must do without them. The method of procedure is usually too cumbersome. For example, suppose it is necessary to find the combined thickness of two boards, each $1\frac{1}{8}$ inch. A boy will frequently proceed by first changing the mixed number to an improper fraction, then multiply the numerator by 2 and finally reduce back to a mixed number giving the answer as $2\frac{2}{8}$ inch. It is an easy matter for the shop teacher to show him how simple the mental process is when the whole number and fraction are multiplied separately. I discovered an interesting thing in this shop arithmetic. I found that when a boy had trouble with a problem in inches, if I gave him a problem in dollars and cents involving the same operations he could usually work it right off.

In brief, my judgment is that while it would not be advisable for the shop teacher to spend much of the time of a class in attempting to teach fractions in a formal way, he should make every effort to assist each boy to find the best way to solve his problem at the time he encounters difficulty.—VERNON E. SAYRE,
University of North Dakota,
Grand Forks, N. Dak.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

PEDESTAL.

THE pedestal shown in the photograph and drawing is a satisfactory project for eighth grade or high school pupils. The column may be made with either mitered or butt joints



PEDESTAL.

depending upon the ability of the workman. The kind of wood and finish depend upon where the completed article is to be used.

—STANLEY MYTHALER,
Spring Valley, Minn.

VIOLIN.

The photograph shown is an instrument "in the white" made by Stanford Berry, a colored pupil of the Cass Technical High School, Detroit, Mich. The work was done upon the boy's own initiative and without particular help from others. The sounding board is of pine, carved and planed into shape. The sides are of maple veneer stock bent about a band-sawed form. The back is made of the same material. The instrument is the sixth one made by the boy. His first one was made of shingles and resem-

bled a ukelale. The second was made from veneer which gave a more correct shape but proved too thin. The third was made from an orange box, and was very heavy. The fourth was made at the Sumner High School, St. Louis. It had a good shape but the walnut used in its construction made it too heavy. The fifth was



VIOLIN MADE BY A DETROIT BOY.

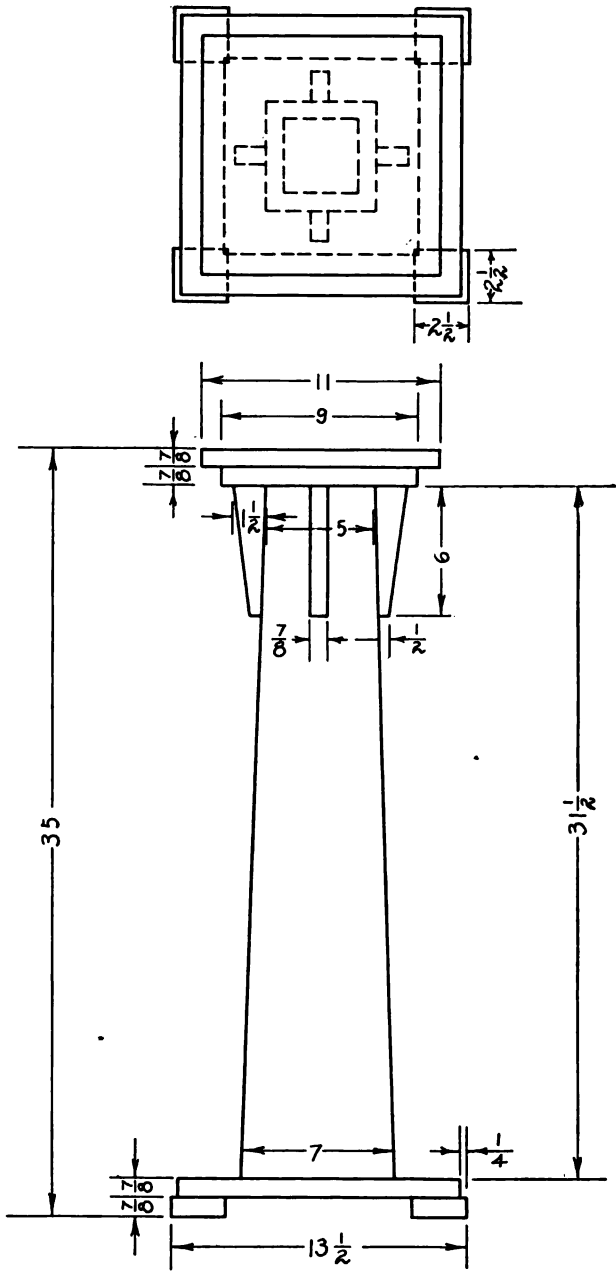
more perfect as to form, weight and shape of front and back, but the fault lay in the length of the neck. The last one gives the maker a peculiar satisfaction as a member of the school orchestra.

—ALEXANDER MACDONALD,
- Detroit, Michigan.

DRILL PRESS.

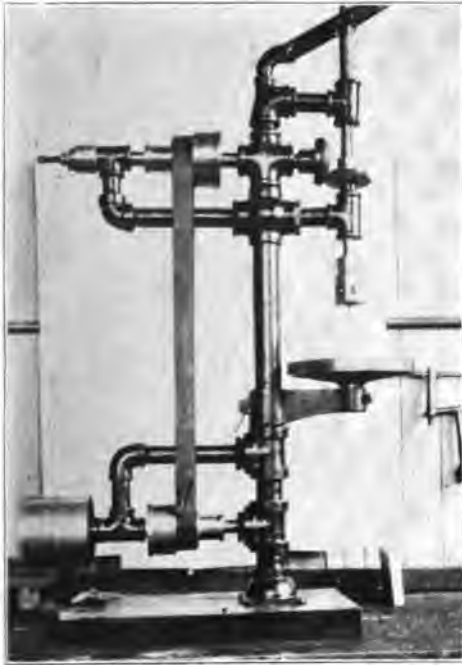
The photograph shows a drill press made by third year boys in second year machine shop practice at Ely, Minn. The machine is made of pipe and pipe-fittings left from heating and plumbing changes in the building. The cone pulleys were made from an old bar of 4-inch stock. The drive pulley was taken from old countershafts. The bearings are babbitted. While gears would be better, friction drive is

PEDESTAL



used. The thrust is taken by a single ball on a cup-pointed set screw. The table is made from the face-plate of an old lathe. The table arm is the only piece which required a new pattern and casting.

—C. M. HEWITT,
Bradley Institute.



DRILL PRESS MADE OF PIPE.

MEDICINE CABINET WITH SHAVING COMPARTMENT.

A medicine cabinet of the usual type is not very convenient to use for shaving, since the door with the mirror in it has to be opened each time any of the accessories are to be used. To overcome this inconvenience a cabinet with a shaving compartment has been designed and several have been made at this school.

The door of this compartment, which from the outside appearance looks like a drawer, will swing downward and form a shelf for the razor and shaving cup as well as any other equipment that may be desirable. This will make it possible to leave the mirror undisturbed during the entire process of shaving. When the shaving is done the articles which have

been in use are simply pushed back into the compartment and the door closed.

A cabinet of this kind will give the man of the house a private place for his shaving equipment—a thing every man seems to have a great desire for.

This cabinet can be made either to hang on the wall or be built into the wall. The accom-



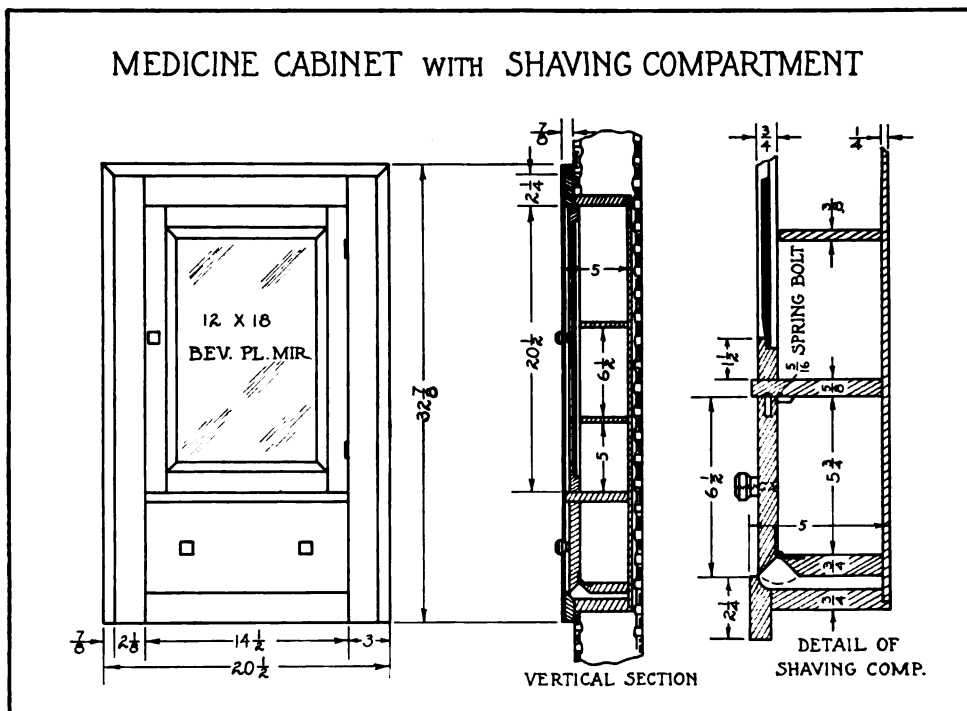
MEDICINE CABINET.

panying drawings and photograph were made of the latter type. This makes a more desirable cabinet.

Any plastered wall can be cut for this cabinet by the following method: Place the cabinet at a convenient height on the wall. Line one side up perpendicular by using a weight on a string, if a spirit level cannot be had. Draw a pencil line around the cabinet. Proceed with an old chisel and saw to cut the plaster making the hole $\frac{1}{2}$ " larger all around than the pencil line indicates. The casing will cover this opening around the edge. If a stud is encountered it may be cut off without weakening the wall to any great extent.

It is usually desirable to place the cabinet directly above the lavatory. In adjusting the cabinet for height the shorter members of the family should be considered as well as the taller. The mirror being 18" high will accommodate all except small children.

It is better to leave off the last two coats of paint until the cabinet is set in the wall. This will eliminate the chance of scarring and also give an opportunity to putty the nail holes



after the cabinet is nailed. If this method is not used the cabinet may be fastened with round head brass or nickel plated screws.

—E. E. ERICSON,
Director of Manual Arts,
East Central State Normal,
Ada, Oklahoma.

caning by three; the finishing by four; and the upholstery by four others. The work was completed in a semester of nineteen weeks, the boys having one continuous half-day of work weekly.

—L. DAY PERRY,
Supervisor of Manual Training,
Joliet, Illinois.

A FURNITURE DISPLAY.

This photograph shows a scheme for exhibiting the work of pupils which should prove suggestive. The settings or walls are permanent. The color scheme is varied from year to year. The hangings and coverings were made by the eighth grade girls, while the furniture is the work of grammar grade pupils varying in age from thirteen to fifteen years. The canned set was made for the reception room of one of the new schools. It is of quartered white oak, fumed, and finished flat. The construction work was done by a group of six boys; the

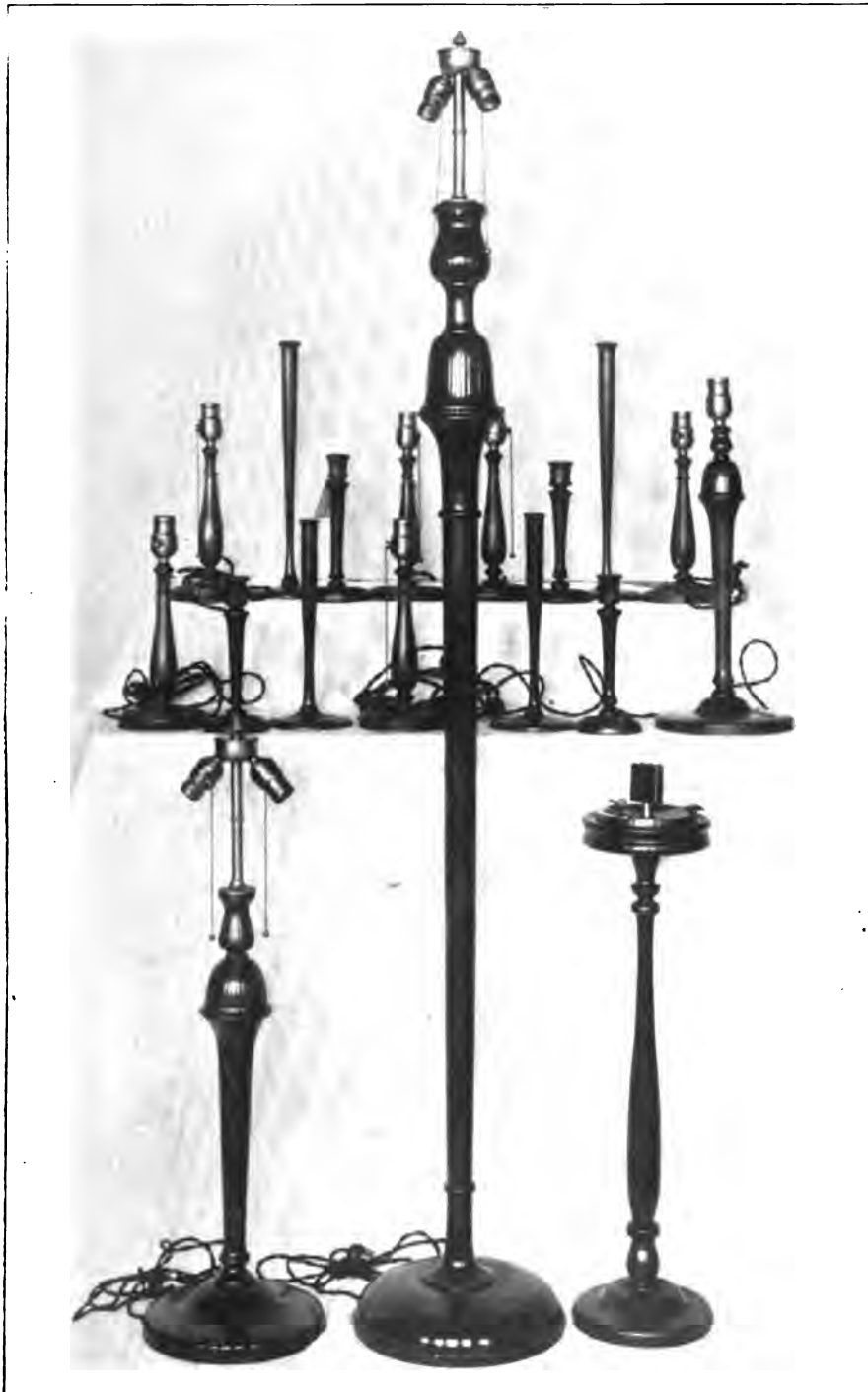
WOOD TURNINGS.

This attractive group of articles were turned by second and third year high school students in the shop of The Northern Normal and Industrial School, Aberdeen, S. Dak. The original designs are the work of the instructor, H. P. Gerber, who has contributed the photograph.

CARVED SILVER CHEST.

This project was designed and made by Ferris Mather, Cincinnati, Ohio, while a student at Bradley Institute. The chest is made of black walnut with the escutcheon of etched copper.

Readers are invited to send contributions to this department—EDITOR.



WOOD TURNINGS FROM THE NORTHERN NORMAL AND INDUSTRIAL SCHOOL,
ABERDEEN, SOUTH DAKOTA.



SILVER CHEST.



A FURNITURE DISPLAY, JOLIET, ILLINOIS.

CURRENT PUBLICATIONS

How Children Learn to Draw, by Walter Sargent and Elizabeth S. Miller. Ginn & Company, 1916; 5¼ x 7¾ in.; 264 pages; price \$1.00.

This book gives the results of a long series of experiments which Professor Sargent and his assistants have been carrying on in the Elementary School of the School of Education at the University of Chicago. In plan and procedure these experiments have utilized the best thought from the field of psychology and child study, the point of view and training of the art schools, and the experience of the expert teachers of elementary school children. But the results as given are not tabulations of statistics; they are, rather, the conclusions of the experimenters, working principles, and suggestive work to be done. The book contains illustrations of typical work.

The one thing that seems to stand out prominently in the conclusions of the book is that "interest in telling something is the motive which inspires all good drawing." Simple as this statement may seem, and readily as it will be accepted in theory by many, its application in practice would produce results but little short of revolutionary in the majority of school systems. But Professor Sargent does not merely state principles; he indicates how it is possible to live up to these principles in practical school work. For progressive teachers of drawing this book is indispensable; for teachers of the other manual arts, it will throw light on methods of procedure in teaching.

The Industrial Arts in Elementary Education, by Leon L. Winslow and August P. Compf. Published by the authors at State Normal College, Bowling Green, Ohio. 6 x 9 inches; 110 pages; price, \$1.25.

This book contains (1) descriptive material regarding twenty of the most important industries, (2) a list of projects suggested by these industries and adapted to instruction in the six grades of the elementary school, (3) a classification of industry, (4) a list of helpful reference books. In the preparation of the book the authors have had in mind two classes of individuals. First, teachers engaged in instruction in the elementary grades; and, second, students in normal schools and colleges who are preparing to become teachers in elementary

schools. In the first instance the book will be a reference work; in the second a textbook for use in elementary industrial art courses.

The point of view of the authors is revealed in the introduction when they say that "for the purpose of organization most of the drawing and construction work done in the elementary schools will fall to the subject of industrial arts, not because industrial arts is a *manual* subject but rather because it is an *industrial* subject, and because industry deals more with activities than do history or geography or arithmetic. As phases of school life, drawing and manual training are at the disposal of all school studies, but the time has gone by when drawing and manual training should be regarded as subjects in the elementary school."

Essentials of Mechanical Drawing, by L. J. Smith, professor of agricultural engineering, Manitoba Agricultural College. Macmillan & Co., New York, 1917. Size, 5 x 7½ in.; 57 pages; price, 50 cents.

This is a brief treatment of the rudiments of mechanical drawing which precede the successful drawing of plans of buildings. The first part of the book deals with mechanical sketching, including some simple lettering. Then follows a suggestive outline for a short course in drawing, using the pencil and ruler. Finally it contains a suggestive list of exercises for a short course in drawing with instruments. It ends with sections of barns and a floor plan of a house.

Furniture Making, by R. S. Bowers, John Bovingdon and other designer-craftsmen. David McKay, Philadelphia. Size, 5½ x 8 in.; 407 pages, with 1082 illustrations; price, \$2.00.

Americans have inherited much of their knowledge of cabinet making and their styles in furniture from England. It is, therefore, natural that many of the most popular books on furniture and furniture making should have been written in England. The present volume is what might be termed a popular presentation of the technical side of a variety of English furniture, mostly modern. The subject is divided into chapters according to the use of the piece of furniture; for example, book cases, clock cases, hanging cabinets, corner cupboards, etc., to the number of thirty-five. The book is

illustrated with photographs, sectional views and other line drawings. The aim is to make the construction clear to the reader. While many of the designs shown in this book are not of the highest type, the book as a whole contains much suggestive material for the teacher of furniture making. It should be used with discrimination.

The Food of Working Women in Boston, by the Department of Research, Women's Educational and Industrial Union, Boston. Published by the Massachusetts Department of Health, 1917. 6 x 9½ in.; price, \$1.00, net, postage extra.

This is Volume X in the series on "Studies in Economic Relations of Women." The investigation covers wage earners fourteen years of age and over who are engaged in gainful occupations in the eight largest cities of the United States. The various phases of this subject have been investigated by experts and the results are of interest not only to social workers but also to wage earners. The chapter giving summaries and constructive suggestions is especially interesting to wage earners for it contains solutions to many of the questions relating to health and diet, and their consequent relation to industry.

Industrial Arithmetic for Girls, by Nelson L. Poray, William R. Dickinson High School, Jersey City, N. J. Published by P. Blakiston's Son & Co., Philadelphia, Pa., 1917. Size, 5 x 7½ in.; 196 pages; price, 75 cents, net.

This is an elementary text for students in home economics. It presupposes a knowledge of arithmetic as usually taught during the first seven years of the elementary school. The book is surprisingly comprehensive. It should be of great service in many schools.

The Young Man and His Vocation, by Franklin Stewart Harris, professor of agronomy and director of the School of Agricultural Engineering and Mechanic Arts, University of Utah. Published by Richard G. Badger, Toronto. 5 x 7½ in.; 204 pages; price, \$1.25 net.

In this book Dr. Harris brings together into small compass the essential facts concerning a

great variety of occupations, and then he erects some guide posts to help a young man in choosing his vocation. He sets up healthy ideals of work, of efficiency, of living in order that a larger proportion of the rising generation may rejoice in their own labor.

Printers' Arithmetic, by Charles L. Woodfield, director of the Chicago Typothetae School of Printing, 536 S. Clark St., Chicago. Size, 4½ x 6¾ in.; 136 pages; price, 60 cents.

This book has grown out of a real need. Its purpose is to present such parts of the printers' trade as may be regarded as essentially mathematical. It is one of those modern specialized textbooks which are coming forward to meet a new demand under the movement for better vocational education.

RECEIVED.

Department-Store Education, by Helen Rich Norton. Bulletin No. 9, 1917, published by the U. S. Bureau of Education. This is an account of the training methods developed at the Boston School of Salesmanship under the direction of Mrs. Lucinda Prince.

Provisional Course of Study in Manual Training, 1917-18, Public Schools, St. Paul, Minn. This is an illustrated pamphlet of 66 pages giving the course of study and projects used in the grade schools as adopted for the present school year.

Machine Woodworking, by George H. Jensen, director of industrial arts, Stockton, California. This is a student's notebook and textbook combined. It consists of ninety pages set up by hand and printed by the sixth, seventh, and eighth grade boys of the Prevocational School of Stockton. A limited number of copies will be distributed free, but any person requesting a copy must send three cents for postage.

The Arrangement of Rectangular Dairy Barns, by R. S. Hulce and W. B. Nevens. Circular No. 199 issued by the Agricultural Experiment Station at the University of Illinois, Urbana, Ill. Contains plans, details, discussion.

MANUAL TRAINING MAGAZINE

DECEMBER, 1917

THE WAR AND INDUSTRIAL EDUCATION IN CANADA.

F. W. MERCHANT.

Director Industrial and Technical Education for Ontario, Canada.

A few weeks ago we wrote to the author of this article for information concerning the effect of the War on industrial and vocational education in Canada, expecting to use the facts gained in our Editorial Review for the Month. When the reply came it was so complete and full of significant facts that we present it as our initial article in this issue.—THE EDITORS.

THE vocational schools of Canada have been utilized for war purposes in two ways: (1) in preparing workers for the industries contributing to the war's needs, and (2) in the re-education of returned disabled soldiers.

When the call came at the opening of the war a very large number of the young men in attendance at vocational schools and technical colleges enlisted. The first effect of the war, therefore, was to lessen materially the attendance at such schools and colleges. A large number of the most highly skilled mechanics also enlisted. The loss of these men to the industries of the country intensified the demand for skilled labor in munition factories, railroad shops, etc. This situation opened up new opportunities for the vocational schools, especially the evening schools, and classes were soon filled by those who rushed in to prepare themselves thru short term courses for special work. The schools did most effective work at this juncture. Some of these special classes are still maintained.

The schools also have taken some part in the training of those who are to go overseas. For example, the mechanics

connected with the Flying Corps centred in this district get their technical training and their shop practice in connection with the Toronto Technical School.

THE TRAINING OF WOMEN FOR WAR ACTIVITIES.

But it is in the training of women for war activities that the schools have probably done their most important work. The demands for garments, soldiers' comforts, hospital supplies, etc., has from the beginning of the war been increasing in urgency. The women of the country have become responsible, thru the Red Cross and other agencies, for meeting a large share of these demands. Accordingly, the schools have become centres for training women in such industrial operations as cutting, sewing, knitting, management of power machinery, etc. Take knitting as an example, probably at the opening of the war not more than five hundred women in the city of Toronto knew how to knit a sock. The exception now is to find a woman or a girl who cannot knit. The schools have been one of the most effective factors in bringing about the change.

The schools themselves have been an important factor in meeting directly the

demand for supplies, because the productive work of the schools has centred mainly in the providing of such supplies. It is not the vocational schools alone that have taken part in this work. In fact, almost every school in the Province, from

The vocational schools have taken a part in the training of the women who have enlisted for service in munition factories. In the beginning practically all phases of the work were taken up by the women, but it has been found that many



VOCATIONAL CLASS. MACHINE SHOP PRACTICE, CENTRAL TECHNICAL SCHOOL, TORONTO.

the higher grades in the public schools to the most advanced classes in the universities has been a centre of industry. The selection of the work to be done in the schools has been determined mainly thru consultation with the Red Cross Society, and the output of the schools has been distributed thru this agency. In some cases, especially in the larger schools, local school committees have kept in touch with the graduates who have enlisted, and the supplies produced have been forwarded to these graduates for their individual use. But, on the whole, it has been found better to affiliate with the Red Cross Society.

of the heavier operations are too exacting. Women still continue to offer themselves in large numbers, and are quite generally employed in factories, but they are now engaged mainly in the lighter operations, and in the work of inspection.

PRODUCTION OF FOOD SUPPLIES.

The need for increased production during the war time is urgent and the Department of Education has made special efforts to meet this need by directing the training in agriculture in schools along productive lines. Most effective work has been done in connection with school gar-

dens and home gardens especially in urban communities.

The demand for labor on the farms is also urgent. The Department last year tried the experiment of freeing children, under certain conditions, from school to assist in providing the help necessary for the purposes of planting, cultivating, and

service but not requiring further hospital or sanatorium treatment and not entitled to any pension.

2. Men requiring further hospital or sanatorium treatment. At the end of this treatment they are discharged either into Class 1 or Class 3.

3. Men who are recommended by a



VOCATIONAL CLASS. AUTOMOBILE: ENGINE AND ROAD REPAIR, CENTRAL TECHNICAL SCHOOL, TORONTO.

harvesting farm crops. All boys over fourteen years of age were given full school standing for three months' service on the farm. The plan worked admirably, and has been extended this year. Girls, as well as boys, took part in this work. Several thousands of pupils have taken advantage of the opportunity of serving their country in this way.

RE-EDUCATION OF RETURNED SOLDIERS.

The soldiers that are returning from the war are divided by the military authorities into three classes:

1. Men who return unfit for military

medical board for either a pension or for a small gratuity, if not entitled to a pension.

The soldiers of the first class usually return at once to their homes and are assisted in finding employment if they desire it.

Roughly, the education work undertaken may be classified as follows:

(1.) Education in elementary and commercial subjects and light shopwork in wood or metal undertaken by convalescents primarily for therapeutic reasons.

(2.) Education for convalescent patients for improvement in academic, commercial and industrial branches.



VOCATIONAL CLASS. TELEGRAPHY: TRAIN ORDERS AND TRAFFIC RULES. COLLEGE ST. HOSPITAL, TORONTO.



VOCATIONAL CLASS. CIVIL SERVICE PREPARATION. COLLEGE ST. HOSPITAL, TORONTO.

(3.) Re-education for soldiers so disabled by their military service that they cannot return to their former vocations. Such men are given training for new occupations suited to their condition and capacity.

In each convalescent hospital there is a vocational officer whose special business it is to interview men. He finds out the occupations they were engaged in before enlisting, determines their needs and desires, and directs them, when advisable, into vocational classes. These classes are organized in hospitals or in professional, commercial, or trade schools, and in the industries themselves.

The classes so far organized in the various schools and hospitals provide mainly for instruction in commercial subjects, civil service preparation, telegraphy, railroad standard train rules and traffic orders, electricity, mechanical drawing, carpentry

and joinery, cabinet making and general woodworking, machine shop practice, motor mechanics,, printing, plumbing, industrial design, painting and decorating, shoe-making, courses for health inspectors, etc.

A soldier's training for therapeutic or for improvement purposes continues until he is discharged, but the re-education work is of a more serious nature and is continued until the man is fit for a new vocation. The soldiers for re-education are selected by a board of three men, a vocational officer, a medical man, and a man engaged in industry or business. Those passed for re-education are continued on the service lists and are paid their allowances as soldiers and are maintained as long as they are engaged in learning a new vocation. The increased ability to earn which the new vocation may give does not reduce the pension to which a soldier is entitled.

A STUDY OF THE RELATIVE VALUES OF THE FACTORS INVOLVED IN MECHANICAL DRAWING.

HAWLEY J. WHITACRE.

Superintendent of Schools, Sutherland, Iowa.

THE purpose of this study was to determine in an exact manner a basis for grading the drawings of students of mechanical drawing. The first problem in obtaining a scale was an analysis of the subject of mechanical drawing into its various factors or elements. After making an analysis of the subject, and after having made a careful study of some fifty texts on mechanical drawing in order to get the various factors as well as might be interpreted from the books of others, it seemed to the author that the analysis most nearly agreeing with the general thought on the subject must take cognizance of six separate and distinct factors, namely, (1) correctness, (2) clearness, (3) accuracy, (4) neatness, (5) lettering and (6) speed.

Correctness is the question of whether the correct idea is correctly expressed and involves correct relation of views and details, correct dimensions, correct notes and data of all kinds, correct use of conventions, etc.

Clearness involves showing fully all necessary information in such a way as to make the interpretation of the drawing practically unmistakable.

Accuracy involves exactness in laying off lines and angles and in subdividing them. This includes exactness in connecting points, in making intersections, in drawing perpendiculars, parallels and tangents, in locating centers of circles, in joining arcs of different radii, etc. This factor of accuracy differs from correctness in that

TABLE I—Correctness.

Value in per cent	10	15	20	25	30	33	35	40	45	50	60	65	70	75	80	90
Times assigned	1	3	6	6	5	1	1	6	2	11	3	1	1	1	1	1
Average, 39.3%	Median, 37.5%															

TABLE II—Clearness.

Value in per cent	5	9	10	15	18	20	25	30	35
Times assigned	3	1	9	14	2	16	7	1	1
Average, 17.4%	Median, 16.5%								

TABLE III—Accuracy

Value in per cent	1	4.5	5	7.5	10	12.5	15	17	18	20	25	30	35
Times assigned	1	1	9	1	14	1	7	1	1	11	4	2	1
Average, 14.1%	Median, 12.75%												

TABLE IV—Neatness

Value in per cent	2	3	4	5	7	10	12.5	13	15	20	25
Times assigned	1	2	2	10	1	14	1	1	17	4	1
Average, 10.9%	Median, 10%										

TABLE V—Lettering

Value in per cent	.1	2	2.5	3	3.5	5	6	9	10	12.5	15	20	25	30
Times assigned	1	2	1	1	1	10	1	1	19	1	7	6	1	2
Average, 11.1%	Median, 10%													

TABLE VI—Speed.

Value in per cent	1	2.5	3	5	7.5	9	10	15
Times assigned	2	2	1	24	1	1	18	5
Average, 7.3%	Median, 5%							

it takes no cognizance of the expression of an idea but rather of the technic of drawing.

Neatness involves general appearance, symmetrical and agreeably proportioned arrangement of problems upon the plate, relative sizes of lines, blots, erasures, misspelled words, etc. It is important because commercial drawings must be neat to be of value.

Lettering is a factor which has much to do with the quality of the finished drawing. Legibility is the first requisite of good lettering, and it is secured thru simplicity and correctness of shape of letters, uniformity of slant and height, and proper shaping.

Speed is the total time taken to complete a given problem. The time taken to produce a drawing is a factor which is over-

looked by some teachers. Time and the speed at which work is accomplished are important.

A questionnaire asking for an expression, in terms of percents, of the relative value of these six factors was prepared and sent to men in positions indicating that they could speak with authority upon the subject. Seventy-two replies were received: 13 from draftsmen, in manufacturing companies; 12 from professors of drawing in colleges of engineering, in universities; 8 from professors of drawing in training schools for teachers; and 41 from teachers of mechanical drawing in high schools. Fifty-four or 75% of the answers received agree with the analysis as it appeared in the questionnaire.

Of the 54 answers agreeing with the above analysis there were 16 different

TABLE VII—Correctness¹

%	10	15	20	25	30	35	40	45	50	60	65	70	75	80	90	Av.
A			2				1		6			1			1	49%
B					3	2	2	1		1	1					36%
C				1	1	1			1	1						37%
D	1	3	3	5	2	3	3	1	4	1			1	1		34%

TABLE VIII—Clearness

%	5	9	10	15	18	20	25	30	35	Av.
A	1		3			5	2			16%
B			2	3	1	4				16%
C				1		3	1			20%
D	2	1	4	10	1	4	4	1	1	17%

TABLE IX—Accuracy

%	1	4.5	5	7.5	10	12.5	15	17	18	20	25	30	35	Av.
A	1		4		2		4							9%
B					4	1		1		2	1	1		16%
C			1	1	1		1			1				12%
D		1			7		2		1	8	3	1	1	16%

TABLE X—Neatness

%	2	3	4	5	7	10	12.7	13	15	20	25	Av.
A	1			4	1	3			2			8%
B		1		1		2			4	2		12%
C			1	1		1			2			9%
D		1	1	4		8	1	1	9	2	1	12%

TABLE XI—Lettering

%	1	2	2.5	3	3.5	5	6	9	10	12.5	15	20	25	30	Av.
A	1			1		4			3		1	1			8%
B		1	1			2			2		1				7%
C							1		2		1	1			12%
D		1			1	4		1	9	1	4	4	1	2	12%

TABLE XII—Speed

%	1	2.5	3	5	7.5	9	10	15	Av.
A	1			2			7	1	8%
B		2		6			2		5%
C				1	1		2	1	9%
D	1		1	15		1	7	3	6%

¹Explanation:

A—Number of times value at top of column was assigned by draftsmen.

B—Number of times value at top of column was assigned by professors of engineering drawing.

C—Number of times value at top of column was assigned by professors of drawing in training schools for teachers.

D—Number of times value at top of column was assigned by high school teachers of drawing.

values, (Table I) ranging from 10% to 90%, placed on the factor of correctness. The average was found to be 39%. This wide variation in relative values assigned is even more interesting when it is noted (Table VII) that there were no values on which a considerable number agreed. This variation is particularly noticeable in the values assigned by teachers in contrast to the more decided agreement on the part of draftsmen. It will be noted that the average value assigned by teachers, which includes professors of engineering drawing, professors in training schools for teachers, and high school teachers, is 35% while the average value assigned by practical draftsmen is 49%, or 14% higher. This average of 49% represents quite accurately the judgment of the men in the field, since there is a decided mode or common value at 50%. It is safe to draw the conclusion from these data that teachers do not place nearly as much emphasis upon the factor of correctness as do draftsmen. In other words teachers are not placing the proper importance on

a factor which is of paramount importance in commercial drawing.

As regards the factor of clearness (Table VIII) it will be noted that while there appears to be no general agreement as to the value to be assigned to this factor the average of each of the groups, except that for the professors of drawing in training schools for teachers, comes very close to the general average for all groups.

Tables IX, X, XI and XII show the distribution of values assigned to the factors of accuracy, neatness, lettering and speed.

If more weight is given the replies from men of broadest experience and those in the most responsible positions the approximate values assigned to the various factors are correctness 40%, clearness 20%, accuracy 15%, neatness 10%, lettering 10% and speed 5%.

The results of the study indicate that teachers need to place not less emphasis on the technic of drawing but more on the development of the power in the student to express an idea.

A CONSTRUCTIVE-PLAY SCHOOL ENTERTAINMENT.

FRED A. HACKER.

Instructor in the McCormick Industrial School, Chicago, Illinois.

WHAT is the height of every youngster's ambition? When you were about so-many-years old what would you have chosen above every other vocation in the world for your life work if you could have rubbed Alladin's lamp and brought it about? A circus man! Yes siree! In the eyes of the youngster, who is the greatest man in the world that ever lived? Buffalo Bill, to be sure!

The ambitions of the Irving School boys and girls were realized a few months ago. When the time came for the selection of the annual school entertainment a burlesque circus was suggested. It was de-

cided to make it entirely a "school made" affair from the making of the animals down to the printing of the advertising matter. Every department of the school was anxious to have a part in the circus. Owing to the nature of the entertainment it was not difficult to find something for all of them to do. Committees were appointed to take charge of the various groups of performers, the costumes, side shows, music, make-up effects, parade, refreshments and concessions, advertising and finance, and the construction work.

The making of the animals and paraphernalia, the erection of the tent, seats



THE TENT WAS PITCHED ON THE SCHOOL GROUNDS A FEW DAYS PREVIOUS TO THE CIRCUS. IT ATTRACTED THE ATTENTION OF PASSERS-BY AND HELPED TO BRING IN ADMISSIONS.



TICKET SELLERS AND TAKERS.

and platform, and all other construction work fell to the manual training department. The boys brought in gunny sacks, poultry netting, some wire, old boxes and newspapers. The school furnished what few other materials were needed. Then the fun of creating animale commenced. A giraffe, several elephants, an ostrich, a half dozen ponies, a "Cuban Gook," and an alligator were made. The general construction of the framework for these animals was alike. The boys constructed the wire frames and the girls helped in the covering, sewing up, and painting. No



NANCY, THE SIBERIAN OSTRICH.

framework was required for the bear, lion, and monkey. The costumes for these animals were made after the pattern of a sleeping garment with feet and hood attached. It took about three weeks to complete the menagerie.

The drilling of the animals and the various groups of performers was done by different departments of the school. The physical training department rehearsed the clowns in their stunts and had charge of

the drills and dances. A burlesque military drill, a girl's clown drill, an Indian dance, pyramid building, and tumbling were among the features gotten up by this department. The Kindergarten was represented by the "Pony Show" and the



KATHERINE, THE ARKANSAS GIRAFFE.

"Merry-go-round." To the English department fell the task of writing up the ringmaster's introductions, the side show ballyhoos, the locals and advertisements for the newspapers. A circus would not be complete without its colored posters. The art department was called upon to make these and other advertising matter. The posters were placed in the neighborhood storewindows and other conspicuous places. The refreshments and concessions were managed by the domestic science department. Home-made candy, peanuts, popcorn balls, and soda pop were among the good things to eat. The routing of the parade, arrangement of the program, and the ticket sales were managed by the remaining departments of the school.



THE GYPSY FORTUNE TELLERS. **SIDE SHOW CHARACTERS.** **HAWAIIAN BEAUTIES.**
SNAKE CHARMERS.



MADAME ZARAZABELLA AND HER GROUP OF WILD ANIMALS.



SIDE SHOW CHARACTERS—THE WILD MEN.

An 80 by 120 tent was rented from one of the local tent dealers. This was practically the only item of expense, but it was a good advertiser and paid for itself by the additional crowd that it attracted.

One afternoon and two evening performances were given, a parade preceeding the afternoon performance. An admission of fifteen cents was charged.

The program consisted of: the grand

march, Professor Bumplayer's clown band, the pony show, Isadore the Irish elephant, Katherine the Arkansas giraffe, the slack wire performance, pyramid building and tumbling, Indian dance, Lady Zarazabella and her wild animals, Captain Morrisio Steffano's regiment of trained soldiers, the educated Cuban gook, a girl's clown drill, Nancy the Siberian ostrich, auto races, and the Dixie flyer and terra-firmaplane race. A concert was given after the ring performance for which an admission of 5c was charged. The concert included: the wild men, the Hawaiian beauties, the Siamese twins, the



SAMANTHA, THE CUBAN GOOK.



THE DIXIE FLYER.

ONE OF THE SENSATIONAL FEATURES OF THE CIRCUS WAS THE RACE BETWEEN THE DIXIE FLYER AND THE TERRAFIRMAPLANE.

tattooed man, the \$25,000 beauty, the fat man, Samson the strong man, fortune tellers, and the jubilee singers.

The greatest pleasure that those taking part derived from the circus was in getting ready for it. The making of the animals and paraphernalia, the drilling and rehearsing, the painting of the posters, distributing the advertising matter, and the many other things to be attended to was a real pleasure for the youngsters. Aside from the enjoyment it afforded the children, it taught them to be original and resourceful in their play, and promoted a desire to do something out of the ordinary with mate-

rials at hand. There were a good many details to be looked after. Every child in the entertainment, and there were 200 of them, was made to feel a certain responsibility. While the children were busily engaged in doing something thoroly enjoyable, they were unconsciously developing some good qualities, initiative and self reliance. The teacher had an opportunity to discover the weaknesses in the children and to correct them. Above all it helped to bring into closer relationship the different departments of the school and encouraged a sympathetic cooperation between them.

HOW I STARTED MY SEVENTH GRADE CLASS THIS YEAR.

Beginning in September, 1915, this Magazine has made a definite effort to stimulate more thinking on methods of teaching shopwork and drawing. From time to time it has published articles on various phases of the subject. Wishing to stimulate a further exchange of experiences and ideas on this important subject, it has now asked several teachers to write on topics similar to the one given above. The two descriptions which follow constitute the first installment of these replies. We hope that other teachers will volunteer to describe their own methods and to discuss the methods employed in these articles. Let us have a round-table conference in print.

THE EDITORS . .

IT was the first time the class had ever been to the shop and they came rushing in without any order at all. I sent them all back out into the corridor and told them that they must come into the shop in a regular order and always pass to the seats at the demonstration bench and each take the seat which corresponds to the number of the bench which would soon be assigned to him.

I asked several boys what their idea was of the purpose of the manual training shop. The ideas were rather indefinite, so I gave them a general talk on what we wanted to do in the shop. The first thing we were to make was to be a bread board and while they were making this bread board they would learn something about the saws, the plane and other tools.

We talked it over and decided on the general size and shape the board ought to

be. The first thing to do was to get out the stock, and the tools we were to use were the crosscut-saw, the rip-saw and the framing square.

I handed out to the class several crosscut-saws and rip-saws and asked them to look them over closely and note any differences in the teeth. Several of the boys noticed some of the differences but not one noticed the difference in the cutting edges. I have large wooden models about 3 ft. long of the two saws with the teeth made the proper shape and the bevels on the crosscut-saw made so the boys can see very easily the difference in the cutting edges of the crosscut-saw and the rip-saw. I showed them that the rip-saw was really a series of chisels with the cutting edges placed perpendicular to the plane of the saw and the crosscut-saw had its chisels placed in line with the plane of

the saw but at an angle with the line drawn along the points of the teeth. With a chisel and a piece of wood I demonstrated the cutting action of the two kinds of teeth. Then with a very short talk the boys were assigned to their benches and we proceeded to get out stock.

We had decided to use $\frac{3}{4}$ " basswood, and the stock was to be 7" wide and 13" long. I told them some of the general characteristics and the approximate cost per board foot. Several boards were



BREAD BOARDS.

brought in from the stock room and placed on the benches. These boards were all several inches wider than the size of the stock, so the rip-saw could be used.

One boy was to mark off the length with the yard stick, the next boy drew the lines across with the framing square, and the board was then placed down in the vises of several benches so more than one boy could use the crosscut-saw. As fast as a piece was sawed off it was given to some boy to mark off for width and rip out and all pieces were placed in one pile. No boy was permitted to pick out his particular piece of stock. I made it a point that every boy should have some part in getting out stock.

The stock being all cut, it was distributed, and the plane-irons were given out, and the boys were told to plane one edge of the stock straight and square with the face. I purposely gave no instruction

at first on adjusting or using the plane. After several minutes struggle with the plane I called the class to the demonstration bench for instruction on the plane; they were very willing to listen and be shown. We talked over just enough of the adjustments at this time so the boy could plane the edge. I told the class to first start with an adjustment so fine that their planes would not make a shaving. All boys want to make thick shavings at first, so the statement was made that generally the best workman was the one who could make the thinnest shaving. This had the desired effect.

The tendency for the boy to swing the plane around at an angle and make the edge curve in will have to be watched and corrected. I have found the most successful method to correct this tendency is to show how a spokeshave, which is really a plane with a very short bottom will follow into a curve. Swinging the plane around at an angle shortens the length of the bottom which is bearing on the edge of the stock, and it is not much better than using a spokeshave.

The edges were finally planed and tested for straightness and squareness with a face. The class was then called together and given a demonstration on the use of the marking edge. I instructed the boys always to check the gage setting with their rule and not depend on the graduations on the gage. The boys first started gaging at $\frac{1}{2}$ " from the edge, and gradually increased the gage setting by half inches up to the full capacity of the gage. They did this on both faces. In using the gage I find that a boy will make a marker dig into the wood by not holding the gage tipped at an angle away from his body. This point must be emphasized very strongly.

After the gaging was finished the boys ripped off the wood outside the last gage

line, ripping close to the line. This gave them some practice in more accurate ripping. The second edge was now planed to the gage line. The tendency here is for the boy to plane off his gage line. When a boy did this I had him gage a new mark $\frac{1}{8}$ " less in width and try planing again until he could plane to a gage line.

The ends we did not plane but I spent some time demonstrating running a knife line around the ends of the stock with the square. The first knife line was made about $\frac{1}{4}$ " from the end and the back-saw was used to cut just off from the line. If the boy did a particularly poor job and sawed off his knife line I instructed him to make a new line and try the back-saw again. This was done at both ends.

In sawing with the back-saw I have found after some experimenting that the boy can do a better job by placing his stock in the vise with a face horizontal. In this way he has all his strength for the control of the saw, and does not have to use one hand to hold his stock against the bench-hook. When the boy uses the bench-hook it is difficult for him to hold the stock firmly, and the saw is likely to jump out of the saw kerf.

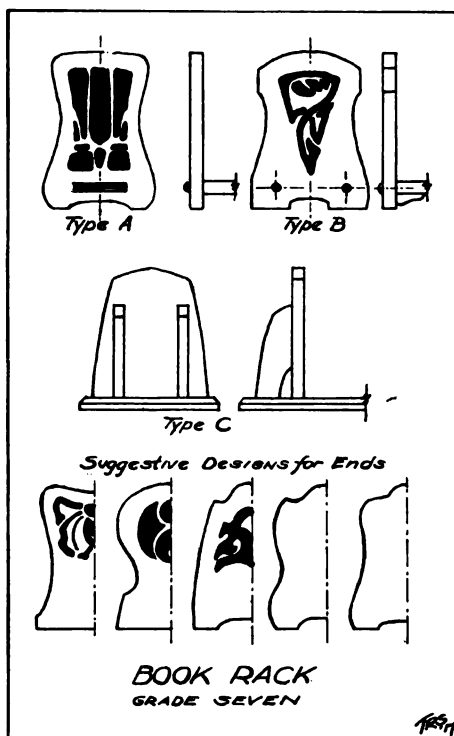
Most of the bread boards were finished in three lessons, and considerable time was given up to the demonstration. I find that the first weeks of shopwork are very important. The fundamental principles of the use of the saw and the plane should be given a great deal of attention. If these principles are drilled into the boys at the beginning of their shopwork they will soon become fixed habits.

WAYLAND R. WOODWARD,
Franklin Experimental School,
St. Louis, Mo.

OUR local schedule provides for three hours a week for 7th grades. This may be a continuous period to be

divided, at the discretion of the instructor, into drawing and shop periods.

I am endeavoring to incorporate into each half year's work some problem of commercial design and in this grade the problem is a designed, decorated book-rack.



My drawing work supplements the shop and it will therefore be necessary to summarize the drawing work in connection with this problem.

DRAWING PERIOD.

The problem is presented thru a general, class-participating demonstration, taking up types of construction, materials to be used, finish, etc. Sizes of racks are determined for each type. Each boy selects one of the three types shown in the accompanying drawing, guided by his taste and mechanical ability. Freehand, two-view, working sketch is put in the note-

book, accompanied by bill of material. The value of materials used is estimated individually from a table of current prices.

The plate is then laid out—views blocked in.

An outline design for the ends is developed from suggestive designs put on blackboard, and after being sketched on folded rectangles of scrap drawing paper, and ok'd by the instructor they are cut while folded, and are ready for use. Free-hand curves, adaptable to the material used, are emphasized. During the next drawing period the decoration is developed in the same way, decoration to be harmonious with the outline, conventional, etc.

SHOP PERIOD.

A class demonstration is given on economical stock cutting. A short demonstration follows on getting the ends of the book-rack to shape and size. The boys are referred to their note-book instructions (6B work) on rules for planing and squaring stock to size.

Individual aid or suggestions are given to the boys as they work. Ends are

checked by instructor, the design traced on wood, and mortises or drill holes located and cut. A large dependable boy repeating work (thru academic failure) cuts out the ends on the band-saw. (After the class demonstration he describes to class the operation of this machine.) Meanwhile, the other boys work on the bottom board. The ends are finished by boys as per demonstration on method. They are then sanded and the decoration traced on them. The bottom board is finished and sanded and the model assembled.

Between lessons the wood is wrapped in individual newspapers to protect from dirt.

A class talk is given on fuming. The boys load the fuming box. After coming out of box and airing, the decoration is painted in Enamelac. The rack is then given a light coat of shellac for a filler and carefully sanded. Then it is waxed. Demonstrations to the class precede all steps in finishing.

T. RAYMOND STAHL,
John M. Conway School,
Pittsburgh, Pa.

UTILITY THE TEST OF ART.

The attempt to relate Art to Industry and to Education promises not only to revolutionize the teaching of Art in our public schools, but to do much toward laying the foundation for a new national Art in America. We are beginning to see that Art is UTILITY expressed in terms of Beauty; that Industry is UTILITY expressed in terms of Labor; that Education is UTILITY expressed in terms of Training. Utility is the supreme test of Art, of Industry and of Education.

—EDWIN OSGOOD GROVER.

EDITORIAL REVIEW OF THE MONTH

AS THE Christmas season approaches this year two thoughts are uppermost in the minds of most of us: What can we send to the boys in khaki? and, What can we do for the little folks? For the schools to make presents to the big brothers who have gone to help Uncle Sam is essentially a new problem. Coat-and-trousers hangers, whisk broom holders, hat racks and necktie racks will hardly do this year. Woodenware and Mission furniture would constitute impediments on the march, and we may do well to recall General Sherman's rule: "An army is efficient for action and motion exactly in the inverse ratio of its impediments." So we will find some other way to express our love for the boys in khaki.

But the children will be here—in the home, in the school, in the town, in the city, and across the ocean. December 25th would not be Christmas if we forgot the children, and Christmas would never be its best if the little folks were to forget each other. And so we are glad to place the picture of the joyful Christmas workers drawn by W. B. Humphrey, on our front cover, and let it strike the dominant note of this issue.

There may be a profounder social significance than we realize in the fact that seasonal problems are more and more coming to have a place in our handwork courses—even our courses in shopwork. It is not an accident that we make bird houses in February, kites in April, and toys in December. And even some of the supervisors who hold most literally to the sound doctrine of carefully organized courses of instruction are coming to see that in the Christmas toy repair shop idea there is something with highly educative possibilities. All depends upon the skill

of the teacher in handling it. With such a high motive as a starting point, educative results surely ought to be made to follow. So far as we know the Francis W. Parker School of Chicago was the pioneer in this kind of work. Seattle followed on a larger scale. Last year St. Paul put some of the same kind of spirit into Christmas work that it has put into bird-house making. Other cities and many individual schools were doing the same kind of work. This year we have heard of plans for Christmas work in Duluth, Des Moines, Boston, and other places.

If unorganized, such work may produce chaos in the school shop; if organized, it may offer opportunity to teach some of the most valuable lessons of the whole year. Let us not take it up thoughtlessly because someone else has done it; and let us not over-do it. We are tempted to quote Shakespeare:

Many things by season are
To their right praise and true perfection!

WAR COURSES IN A HIGH SCHOOL.

FOR several months we have been learning of the extremely valuable war courses that have been inaugurated at Dunwoody Institute, Wentworth Institute, Pratt Institute, and several of the higher schools of engineering, but now we are beginning to hear of rather definite war work that is being started in the public schools. One of the most striking examples of the latter comes to us from G. L. Conlee, director of industrial arts at Walla Walla, Washington. In a recent letter he says:

The entire manual training equipment of the Walla Walla Public Schools was recently thrown open to the members of a Washington

Field Artillery Battalion for a period of four weeks.

Courses in blacksmithing, woodworking and map-making were offered with a marked degree of success. The class in blacksmithing

was given elementary bending, forming, heating and tempering, the exercises offered differing from the conventional high school models in that they dealt with army wagon construction and repair. The class in woodworking dealt with camp equipment construction and temporary bridge construction of army types. Camp-chairs, seats and tables were constructed from ordinary camp refuse. Model bridges involving hasty construction from materials close at hand were built. The class in map-making took up elementary drawing as applied to sketching; field sketches were made of various localities and drawn out on cross-section paper. Various topographic symbols and representations common to army practice were used. Simple contours and methods of obtaining and plotting the same were dealt with briefly.

Due to the departure of the battalion for the East the classes were closed sooner than had been originally planned, but the success of the venture was very apparent

This experience of Walla Walla may serve a suggestion to some other patriotic town near a military camp.

THE WAR AND THE ELEMENTARY SCHOOLS OF ENGLAND.

THE War is placing a premium on intelligence and skill that surely must have its effect upon the attitude of the public toward the support of education.

Mr. Herbert Fisher, Minister of Education and the president of the Board of Education, Great Britain, in presenting a resolution to increase the school funds by \$15,000,000, paid a fine tribute to the efficiency of the elementary schools of England, as demonstrated by the experiences of the War. Here is a paragraph from his speech:

If anybody had doubted the value of our elementary schools, that doubt must have been dis-

pelled by the experience of the War. What are the plain facts of the situation? An immense Army has been suddenly formed out of volunteers, an Army, let it be observed, mostly recruited from the elementary schools, and I venture to assert that this sudden and brilliant military improvisation could never have been achieved if we had been working upon the basis of a population entirely uneducated. This wonderful achievement implies trained powers of assimilation, the instructed conscience, the well-directed will, and an instinct for good conduct.

THE English schools are emphasizing now the making of toys and gifts, very likely for the reason that they not only offer excellent projects for handicraft work, but also because they are exceedingly useful and timely in view of the fact that the rather wonderful German toys and gifts are no longer available. The same absence of German toys prevails in this country. This is an added reason for making the construction of toys and gifts one of the central features of this number of the Magazine.

AN AIRPLANE SCHOOL

THE Standard Aero Corporation of New York has established a vocational school for aeroplane workers at its factory in Plainfield, N. J. This school has been established to meet the rapidly growing demand for capable men in the aircraft industry. The course covers ten departments of work in each of which the student must show ability. These departments are: (1) rough filing, (2) final filing, (3) bending, (4) fitting, (5) brazing, (6) woodworking, (7) tank and aluminum work, (8) cover and varnish work, (9) sub-assembly, and (10) final assembly. Students are paid from 20 to 30 cents an hour, according to their education and previous mechanical training, for time spent in the shop. It is estimated that the average student takes three months

to complete the course. He is then considered an "air-plane mechanic."

This school is giving training to quite a large number of young men who are awaiting their appointments to the Government Air Service either in the Army or the Navy. A recent graduate who has entered Mineola Field is Andrew Reid IV, nephew of General Joffre.

RE-EDUCATION OF THE DISABLED

IN ALL probability not one person in a hundred ever heard the word "re-education" before reading the very recent newspaper accounts of the Government's plans as announced by Surgeon-General Gorgas for re-habilitating and re-educating the disabled soldiers. We have been in the habit of seeing blinded and crippled men selling lead pencils at street corners, and we have given our pity and our penny. We have seen the wonderful rugs woven by the blind assisted in the drawing and setting up by seeing people, and we have bought them, impelled by a sympathetic interest in a charitable cause. We have heard some exceptional persons, who have conquered tremendous handicaps, describe her methods of studying college subjects, and competing successfully with those who are unhandicapped, and we have said, "How wonderful!" and stopped thinking at that point.

As a nation we have failed in our duty to make the physically handicapped economically self-supporting and normally strong. It is an educational problem as great, if not greater, than that of assisting the mental defective.

Only within two years have the vocational schools of our country even thought of instructing their pupils in the general principles of safety. Only since workingmen's compensation laws and industrial insurance have come to the foreground in legislative halls have public men given

a thought to the appalling need for "safety first" instruction in factories and in technical schools.

For the duration of the war our thought of safety appliances for industrial life in peaceful times sinks in the background and we think only of devices for preventing suffocation by poisonous gases, of means of withstanding liquid fire, or deflectors for bullets, and camouflage for marching troops. But notwithstanding all these precautions, the inevitable results of war are before us.

The war simply makes the question of re-educating and re-habilitating the disabled a striking one. But we must not forget that the problem of the injured is always with us. It may not be amiss to point out that 54,001 men and women were actually killed in the United States during the year 1913. This means one killed every ten minutes. Over 2,000,000 men and women are injured in the industries in the United States each year. This means one injured every sixteen seconds. The economic loss from accidental deaths and injuries is nearly \$500,000,000 annually and the loss from preventable accidents and diseases would more than pay the cost of maintaining all the public schools in the United States. These are appalling figures.

At present the great fear of every boy who goes to war and of every sister and mother of such boys is that he may go thru life maimed and dependent. But we never think of the ever-present danger to these boys of being handicapped physically by merely going to work, and yet there are more persons so disabled thru accidents in industrial life in normal times than in war.

When our boys come back from the war, physically disabled, and thru the Government work in re-habilitation and re-education are made self-supporting and

self-respecting members of society, we will begin to appreciate that we have been extremely negligent in the past in limiting our efforts to help the crippled and blinded to the good offices of charity and philanthropy. It is a public matter. It is a problem of education. It is an opportunity for service for the teachers of vocational training, for the experts in vocational guidance and direction, for the directors of placement and employment bureaus, and for the designers of special tools and machines for the handicapped. It is an immediate problem in this time of war. It is even more significant in time of peace.

A PROGRESSIVE MOVEMENT IN KANSAS CITY.

A NEW type of extension work has been started in Kansas City. For years extension courses for teachers have been common in the larger cities, including Kansas City, but apparently no thought had been given to special pedagogy courses for the improvement of manual training and industrial teachers until this fall when the men themselves took the matter in hand. It was then that the school authorities took over the plan and added it to the series of extension-study courses under public school supervision. Prof. Ira S. Griffith of the University of Missouri has been engaged to give a course on "The Teaching of Manual Arts." The school board pays one-half of the expense and the men pay the other half. To do this work Mr. Griffith goes to Kansas City once a month for eight months. He meets the teachers at 4:30 for a lesson and again at 7:30. The course is not so much a discussion of the details of shopwork as of the psychological basis for such work, made clear by many concrete examples and incidents gathered in teaching and in practical work.

This is a type of extension work that ought to grow. Every city corps of shop-

work teachers in the country would profit by such a course.

FARM MECHANICS IN CALIFORNIA.

AS THE regulations concerning vocational courses under state and national control becomes more definite our interest is increasing in the proportion of time that is being given to farm mechanics. A good example is found in Bulletin No. 23 issued by the California State Board of Education. Under the title "Provisions and Requirements of the State Board of Education Relating to Standard Vocational Courses in Agriculture" we find (1) that a one-year course is recommended, (2) that each pupil's work must be planned to cover a period of not less than 36 weeks, (3) that not less than three hours a day are to be devoted to farm project work and farm mechanics, and three hours to academic subjects, (4) that not less than three-fifths of the time set apart for farm projects and farm mechanics must be devoted to the project work, and not less than one-fifth to the mechanics.

Counting five days as a week's work, this means that 108 hours of the year's work must be given to farm mechanics and that no more than 216 hours may be given.

The subjects to be taught in this 108 to 216 hours are enumerated as follows:

That the course in farm mechanics during the first year shall consist of farm carpentry, concrete and cement work, plumbing, pipe fitting, tinning, and the care and repair of farm buildings, machinery and tools; and may include farm blacksmithing, a study of pumps, motors, steam and gas engines, automobiles, electrical wiring, and such other mechanical occupations as are essential to the preparation of a well-trained farmer. (The age, strength and experience of each pupil should govern the extent and intensity of his training in this course.)

To the teacher who is in the habit of spending 120 hours in teaching one of

these subjects, and then feels that he needs more time, such a program is little short of discouraging. He is tempted to say that it is an impossibility. On the other hand, this amount of time is a more liberal allowance than is found in some schemes for agricultural training. It is evident that in such a course "farm carpentry" and "farm blacksmithing" and "repair of farm machinery" cannot mean anything like a thoro preparation in these subjects. At best it can mean only a small section of each subject named; at worst it can mean a superficial smattering. Here then is the problem for the teacher of farm mechanics: to select fundamentals from all, or most of these lines of work, and weave them into a unified course that is neither "farm carpentry" nor "farm blacksmithing" nor "repair of farm machinery" at their best, but "farm mechanics." Institutions for training teachers, and employers of teachers, may discriminate between the two types of work:

A TRIBUTE TO DR. FRISSELL.

EVERY one of our readers who has ever come in personal contact with Dr. Hollis B. Frissell, principal of Hampton Institute from 1893 to 1917, will recognize the special appropriateness in the following tribute by George Foster Peabody, for thirty-three years a Hampton trustee, spoken at the grave of Dr. Frissell in the Hampton Institute Cemetery. He spoke on "The More Abundant Life," a theme which Dr. Frissell himself had preached and lived. Here is one sentence from Mr. Peabody's tribute:

"I believe as the world needs more abundant life, we can feel that we are privileged to have known this abounding life and have faith and courage that our lives may hereafter be more abundant in the quality of giving, which was the unique quality of Dr. Frissell."

The principal memorial service was held in the beautiful school church, from

which Dr. Frissell had sent forth thousands of people with a new vision of life and a strong determination to work together for the good of all men.

Here Dr. Francis B. Peabody, professor emeritus in Harvard University spoke of Dr. Frissell as a great builder. Comparing the founder of the Institute, General Samuel B. Armstrong with Dr. Frissell, he said:

Armstrong was the founder, Frissell was the builder, and the School is the incarnation of these two personalities. Yet never were two personalities with a single aim more distinct in type.

Armstrong was magnetic, impetuous, volcanic; Frissell was reserved, sagacious, prudent. The gifts of the one were those of action; the strength of the other was discretion.

Initiative, originality, even audacity were essential to begin the work and inspire confidence in it, but when a great institution had been established and must be developed without mishap, then the time had come for a peculiar quality of wisdom, patience, tolerance, and foresight, which could apply to larger tasks the ideals of the founder.

The November number of the *Southern Workman* (published by the Hampton Institute Press) is a memorial to the late Dr. Frissell. It contains nearly seventy appreciations and is a marvelous tribute to the world-wide influence of this quiet worker for undeveloped races. Prominent educators testify to the help given them by Dr. Frissell in the working out of national problems; Southern schoolmen tell of his sympathetic understanding of their perplexing questions; principals of schools return thanks for his hearty co-operation and active assistance; prominent colored men testify to his belief in brotherhood and equal opportunities for all men; his pupils and graduates, Indian and Negro, do him honor. He is called an educational statesman, a rare patriot, a Christian gentleman; and high tribute is

paid to his modesty, geniality, unselfishness, and wisdom. Few citizens of the Republic could receive higher praise.

THE LAST HORSE-CAR.

ON the 26th of July there appeared in one of the New York daily papers the following pathetic announcement:

To-day a single horse-car operating on the Bleeker street line made its last journey, the directors of the New York railway having to abandon the line, and it was officially announced that no other horse car in all the city now survived.

Fifty-three years ago, according to the *Christian Science Monitor*, New York

City celebrated the advent of its first horse car. Then everybody welcomed the horse car; now nobody mourns its departure. A sign of progress has in fifty-three years become a symbol of slowness.

JUST as we go to press we learn that the National Industrial Conference Board composed of eighteen national associations of manufacturers, and engaged in comprehensive industrial research has asked the University of Chicago to release Professor Frank M. Leavitt for four months to assist in devising means to increase the supply of skilled workers for war industries. Professor Leavitt will be in Boston before this number is distributed.

WASHINGTON CORRESPONDENCE.

TWO CONFERENCES OF SPECIALISTS.

RECENT activities of the Division of Vocational Education of the U. S. Bureau of Education include arrangement of programs for two conferences of specialists called by the Commissioner of Education: (1) supervisors of home economics, New York City, November 23, 24; (2) directors of courses for the training of teachers and directors of manual training and industrial education, to be held at the University of Missouri, Columbia, December 13, 14, 15.

Among the topics included in the New York conference are: special problems confronting home economics teachers under war conditions; Red Cross service; teaching the care of infants to girls in home economics classes; modification of food courses to meet present emergencies; problems involved in cooking in family quantities; sale of products of home economics laboratories; extension courses for older women.

The conference at Columbia, Mo., is to devote one session to each of the following topics, in addition to others: Federal aid

under the Smith-Hughes Act for the training of teachers of trade and industrial subjects; certification of teachers of special subjects; report of a committee which has been making a special study of practice teaching.

A COMPREHENSIVE project of the greatest interest and importance for training instructors and skilled mechanics for the shipbuilding industry has been undertaken by the U. S. Shipping Board. An Industrial Training Section in the Emergency Fleet Corporation has been organized with headquarters in the Munsey Building, Washington, D. C. At its head is Egbert C. MacNary, who has been given leave of absence for this purpose from his position as director of industrial education in Springfield, Mass.

A TRAINING DEPARTMENT IN EACH SHIPYARD.

The objective is the organization of a training department in each shipyard, at the head of which is to be placed a director who will have full charge of all matters pertaining to the training or

"breaking in" of workers and general supervision of the training department. The director and his staff of instructors are to devote their time and efforts to training men, and will not be charged with the usual duties of production foreman.

It has been established that the further necessary expansion in the shipbuilding program depends absolutely on the creation of increased forces of skilled and semi-skilled men. The country has been searched for men having knowledge of any branch of shipbuilding, and yet the supply of mechanics is utterly inadequate to carry out the program of the Shipping Board. Officials have come to the conclusion that further increases of working forces must be made thru training men, and that this must be done immediately and on an unprecedented scale. Workers from a wide range of occupations are to be secured and given short intensive training courses to fit them for the special lines of work in which men are needed.

TRAINING

THE DIRECTORS AND INSTRUCTORS.

The typical foreman in a shipyard, as in most industrial plants, possesses no special skill in giving instruction to the men who work under him. The first step in the program of the Industrial Training Section, therefore, is to organize for the entire chain of shipyards a source of supply of trained directors and instructors. At one of the important shipyards, probably Newport News, Va., an instructors' training center is to be established, in charge of a staff of industrial education specialists directed by Mr. MacNary.

Each shipyard is invited to send to this training center one or two prospective directors and a delegation of skilled workers representing the trades in which trained men are most needed. Each prospective instructor will be trained to teach only the trade in which he is thoroly experienced.

The yard sending the prospective directors and instructors will pay the wages and the necessary expenses of the men while they are taking the training.

The staff of industrial education specialists employed by the Emergency Fleet Corporation will put these skilled workers in possession of effective methods of giving trade instruction. The course will extend over a period of four to six weeks. For one-half of each day the men will be instructed in the methods and devices of teaching. During the other half of each day they will be employed in actually instructing groups of workers in the yard, under the supervision of the training staff.

When the men have completed this preparation, they will return to their yards and set up training classes for breaking in new men and for advancing employes from their present jobs to those requiring greater skill.

It is expected that as a result of this training, one, at least, of the men sent from each yard will have shown himself to possess some qualifications of a fairly efficient director, and that the other men will have had sufficient training to enable them to serve as instructors and to assist in the development of training schemes in their yards. Each yard will then have the nucleus for a training department to which instructors may be added until the capacity is reached for giving emergency training to the number of workers required.

The plan provides for receiving the prospective directors and instructors at the training center in groups of 150. When the plan is fully organized, therefore, it contemplates turning out 150 men every four or six weeks with this minimum amount of preparation.

PLAN FOR SELECTING PROSPECTIVE INSTRUCTORS.

In view of the fact that men are to be withdrawn entirely from productive in-

dustry, not only during the period of training proposed, but also during the time they serve as instructors, the seriousness of the existing emergency is emphasized. There is also the interesting inference that high officials are counting heavily on the results of this enforced investment in industrial education.

Realizing the responsibility involved in asking the yards to make these concessions in the time of men taken from production, the director of industrial training has proposed a definite plan for selecting candidates for the training classes.

In selecting men as prospective directors, the superintendents of the yards are asked to look for men having as many as possible of the following qualifications: (1) experience in charge of men, and demonstrated ability in directing groups; (2) natural ability as a leader; (3) the equivalent of at least grammar school education; (4) not less than five years' experience in shipyard work; (5) preference should be given to men who have secured some technical education; (6) age, between 25 and 40 years.

The following qualifications are to be considered in selecting prospective instructors, who should in all cases be selected from the trades for which the local yard is most in need of trained help: (1) not less than five years' experience in the trade he is expected to teach; (2) the equivalent of at least grammar school education; (3) he should have the respect of fellow workers, and show some of the following traits—patience, dependability, regularity, clearness of expression; (4) experience in directing the work of others; (5) age, between 25 and 40 years.

The topics included in the instructor-training course include: (1) analysis of operations in jobs; (2) analysis of teaching operations for these jobs; (3) planning the steps in instruction; (4) methods

and devices for giving effective instruction; (5) preparation of instruction material—mechanical and technical; (6) development of training schemes to meet special conditions.

EXTENT OF DEMAND.

The extent of the demand for skilled workers in the shipbuilding industry is not generally appreciated by the public. Until recently the largest shipyard in the United States was one containing five ways. When running at full capacity each way provides employment for approximately 1,000 men, including the contributing shops and drafting rooms. At the present time there is under construction near Philadelphia *one* shipyard which will have 50 ways, and which will demand 25,000 men within the next six months. The Emergency Fleet Corporation has announced that fully 60,000 additional men will be required during the next few months in the Philadelphia district alone. The solution of the problem evidently is to take skilled and semi-skilled men from kindred trades, in large numbers, and give them short intensive courses of instruction in selected fragments of the shipbuilding trades.

APPEAL FOR ASSISTANCE.

On October 13th Mr. MacNary sent out to a large number of vocational schools an appeal for assistance in connection with this emergency need for men qualified to organize and direct such training schemes in large industrial plants. Vocational schools, and especially those engaged in training teachers, which can spare one or more members of the faculty having the necessary qualifications, by arranging temporary leaves of absence, have been asked to communicate at once with Mr. MacNary.

FEDERAL BOARD FOR VOCATIONAL EDUCATION.

AN immense amount of work was accomplished by the staff of the Federal Board for Vocational Education during the Month of October in detailed study of the plans submitted by the various State Boards, and in conferences with the staff of field agents with reference to their duties and responsibilities.

STATE PLANS APPROVED.

At the regular meeting of the full Board, held on October 18th, the plans submitted by the following states were formally approved, and the amounts due from the Federal treasury for the first quarter ended October 1, 1917, were duly certified to the Secretary of the Treasury: for all funds, Arizona, Arkansas, California, Maine, New York, Pennsylvania, Utah; and for agricultural education fund, Texas.

NEW APPOINTMENTS.

The following additional appointments have been announced: District No. 1, with headquarters at New York City; agent for industrial education, Harry B. Smith, formerly director of industrial education, State Teachers College, Albany, N. Y.; agent for agricultural education, Rudolph Sussman, formerly director of agricultural education, Reading, Mass.; E. Joseph Aronoff, formerly private secretary to Senator Martine, of New Jersey, has been appointed secretary to the Federal Board.

STUDIES IN COOPERATION WITH OTHER GOVERNMENT AGENCIES.

THE most interesting announcement of the month relates to a number of studies inaugurated by the Division of Research of the Federal Board, to be made in cooperation with other Government agencies.

The first of these was referred to briefly last month—the vocational re-education

of crippled soldiers and sailors, in cooperation with the Surgeon-General's office of the War Department. Major Murray and Major Henderson have been detailed to the study of problems of commercial and industrial education. To the staff has been added also Major A. C. Monahan, specialist in agricultural education, transferred from the U. S. Bureau of Education.

In cooperation with the Signal Corps, the Federal Board will undertake to organize the necessary facilities for training 15,000 radio operators, to be selected from among the men subject to the second and subsequent drafts. An appeal will be made to all higher technical institutions, and to all technical and vocational schools of secondary grade, for students to enroll in these courses. Every city will be given the opportunity to qualify as to teachers and equipment for offering courses. The plan proposes evening courses principally, with possibly a few part-time day courses. Teachers are to be drafted from among skilled radio operators and telegraphers.

In cooperation with the Emergency Fleet Corporation, the Federal Board will undertake an analysis of the occupations in the shipbuilding industry, in order to define the limits of the teaching problem, and to determine to what extent skilled workers from other and not dissimilar occupations may be utilized and trained quickly for shipbuilding.

The Federal Board has also been requested to submit a plan for consideration by the War Department, whereby large numbers of men may be trained for skilled and semi-skilled service in the occupations demanded by the Quartermaster's Corps. A great many occupations are involved, ranging from bakers, blacksmiths, motor car mechanics, to masons, painters, plumbers, and wheelwrights.

OPEN QUESTIONS

"There is more to be said on this subject."

TOY MAKING

Here are some questions asked by Frank H. Shepherd in the October number of the *Teachers Exchange*:

Are you planning to have at least one class in toy making and repairing so as to conserve the scrap lumber about the shop, the broken toys about the homes? Are you trying to get each of your boys to build a bench for his home and to begin the collection of a set of tools for himself? These are the things we want to hear about.

Do you know that Japan is taking over the toy industry since the supply from Germany was shut off? Why not start a toy or novelty works in your city?

And here is another question taken from the November number:

Why not devote two weeks to the manufacturing of toys? Start in by repairing a few, and in the meantime study toys. Go to a toy store and talk with the manager, and the salesman or saleswoman. Find the best sellers, pick out a few that your boys can make and go to work for about two or three weeks on an intensive toy campaign.

If you happen to have a lodge of B. P. O. Elks in your town tell them that your boys will make two or three toys for every child in the town that Santa Claus is not likely to visit, if they, the Elks, will furnish the material. Go to the editor of your home paper and put up your plan to him. I am sure you will find they will cooperate. Start something and then tell the other fellow what success you had.

VERTICAL OR SLOPING LETTERS.

Mr. Editor:

I was very much interested in the various discussions on lettering in the September issue of the *Manual Training Magazine*. Lettering, as most drawing teachers know, is a part of the work in mechanical drawing which requires constant attention, and at best the desired results are not readily obtained. It takes

some time for students to become good letterers. For this reason many young teachers in this branch often wonder whether they are using the right methods, or rather, teaching the correct style of lettering.

Some time ago I read an article on this subject in the *Bulletin* of the American Society for the Promotion of Engineering Education. This article was no more than a valuable collection of data, collected and put into tabulated form. The data was obtained by H. O. Rugg of the University of Illinois. He sent a questionnaire to 118 higher institutions, including practically all of the leading technical schools, colleges, and universities, giving a four-year course in engineering, asking for specific data on the subject-matter and methods of their lettering instruction. He received answers from 71.

This article by Mr. Rugg I consider the best guide for mechanical drawing teachers in high schools. In this data we find that 21 institutions laid stress on the slanting upper and lower case lettering, while only one laid stress on the vertical upper and lower case lettering. Others used a combination of the two. Thirty-three institutions used the slant type only, while but four used the vertical type only.

In replies from manufacturers of machinery Mr. Rugg found that 15 used slant type only, six used the vertical type only, four used a combination of the slant and vertical, 13 used capitals only. This refers to the engineering type of lettering.

This data ought to give the teacher some idea of the type which should be taught in high schools, as it is of some importance that the leading universities, technical schools and manufacturers most decidedly favor the slanting type. Personally I favor the slanting type for high schools. It is easier and more natural.

In answer to the question concerning the textbooks used in the teaching of this subject, we find that 24 institutions used Reinhardt's book on lettering, 16 used no texts at all, nine used blueprints, six used *Engineering Drawing*, by French, the other books noted were not so popular.

—J. W. ZELLER,
High School,
Jacksonville, Fla.

Dear Editor:

MANY KINDS OF WORK OR FEW?

In looking thru the November issue, I came across the letter from H. A. H. asking whether it is advisable to give many kinds of work or few, and I am tempted to reply, as I have a school in a similar community in Ohio (the Ravenna Consolidated School). I have come to believe that we should no longer be satisfied with the limited amount of experience to be gained in our good old woodwork and mechanical drawing. I would branch out to the very limit, as there's so much more experience to be gained in work of different kinds. But I would, by all means, select those subjects that are of real value in the particular community in which the school is located. I think perhaps H. A. H. has many rural boys in his classes, as he says his county is mainly devoted to agriculture. If so, why not offer courses in forge work, and harness making, and cement work, and branch off from a course in bench work into a good course in house framing? These are all subjects that would take well in a farming community, and change what is now an indifferent attitude toward manual training, into appreciation of the same.

Even tho some of his boys be town boys, that would present little difficulty, as they could all take the elementary courses together, and then branch off into different advanced courses. My forge boys branch off into agricultural forging for rurals, and ornamental iron work, such as fire sets, door knockers, and machine parts for city boys. Woodworkers, branch off from an elementary course in benchwork into house framing and rural problems for the rurals, and cabinet making, such as furniture problems for the city boys. The leather workers do the same, but by all means make this course flexible. Just because a boy is a rural boy don't force him to take rural work; merely offer it to him. He'll take what he wants, and be happy in his work.

Then the question will come up, "How can one handle so many different subjects?" I feel sure that any one sufficiently interested can more than keep ahead of his classes by attending some of our splendid summer schools, as courses can be had in almost any subject now.

Then in answer to the schedule trouble I have long since quit trying to give class instruction at certain definite intervals. I let my boys come in when they can, but the minute

they come in the door, I know what they are going to do, as their problem is also my problem, and they get individual help. Of course this becomes rather heavy if one were to have more than 24 or 25 boys at once. In schools of this type I think 15 to 20 would be a better average.

Sending this in the hope that it may be a little help to H. A. H. in solving his problem, I am,

Cordially yours,

—JOHN W. DIRKSON,
State Normal College,
Kent, Ohio.

OBJECT TO MANUAL TRAINING FOR THEIR BOYS.

Mr. Editor:

At one time manual training work in our city began in the seventh grade. It has been gradually taken out of the grades until at the beginning of last year there was no work offered in either the seventh or eighth grades. This year woodwork and mechanical drawing are offered as an elective in the second semester of the eighth year, which is, in this school, the second semester of the first year junior high. The other electives are business methods and a modern language. I understand that the reason manual training is no longer compulsory in the grades is because a number of parents did not wish to have their boys take the work.

Is there any way to overcome this objection and get the work established in the seventh grade?

—C. E. PAUL.—

Perhaps some one has successfully met such a condition and can tell how he did it.

WOODWORK FOR COUNTRY BOYS.

Dear Mr. Editor:

Being in doubt as to how I should proceed, I am taking the liberty to ask your advice.

In my freshman high school class, twelve out of the seventeen are country boys, and haven't had any shopwork. They took the drawing up very slowly, but are now doing well. I want to start them with the shopwork next week, and I want to ask you how to start them out. Should I give them about the same projects as one would give the eighth grade town boys,—or what?

—O. L. H.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

CHRISTMAS TOY MAKING IN SEATTLE.

CHRISTMAS toy-making, which has come to be an annual event at the Washington School, Seattle, may be said to be the product of an evolution rather than the result of carefully laid plans. Some five years ago, a few toys, broken, out of adjustment or in need of paint, were brought to the school shop and put in repair. More toys appeared; a repair department gradually took shape, and Christmas morning found hundreds of once discarded toys in good repair and bright with new paint and ready for distribution to gladden the hearts of those less fortunate little ones to whom Christmas expectancy usually ends in disappointment.

Toy repairing found favor in other schools, and toys, broken in transit, or damaged by promiscuous handling in department stores, became scarce and hard to get. A real need had been disclosed, however, a need that must be filled, and toy manufacturing followed as a matter of necessity. And so, each year, as Christmas time draws near, the boys prepare with much interest and eagerness for their six weeks of toy-making.

I presume such measure of success as we have achieved has been due, largely, to a more or less efficient organization. A foreman heads each of the departments into which the toy-manufactory is divided. These heads, chosen with respect to their particular ability, are given a little preliminary training, both in management and in the special line of work which they are to supervise, in order that when the work is under way, the various parts may go thru the several departments in as orderly and systematic a fashion as possible. All the boys are invited to bring in pictures, sketches, ideas—original or otherwise. As this is not a commercial enterprise, no one hesitates to adopt or adapt any idea he may happen across. This material is turned in to the drafting department, which high-sounding title indicates the section where these contributions are reduced to working drawings and added to the accumulations of previous years. Here the material bills are made out and a record kept

of materials used, costs, number of finished toys, etc.

The stock bills are turned over to the material man who supplies the machine operators, and those who lay out joints, designs, etc. As the parts come from the several workers, they are passed on to the stock-keeper who keeps



A MODERN SANTA CLAUS.
(WITH APOLOGIES TO THE CUBISTS.)

his stores systematically arranged, and properly lettered and numbered. His clerk maintains a complete record of receipts and shipments. No goods go out except on requisition, properly ok'd. Assembling groups are located in different parts of the shop, and near by are subsidiary industries where orders may be left for drilling, boring, riveting, soldering, wire work, forging, sanding, gluing and the like.

Perhaps no one takes more genuine pleasure in the results of the handiwork of his department than does the foreman of the paint shop as he sees the finished toy emerge in all its shiny splendor. On one occasion, last year, as the



MAKING NEW TOYS.



SANTA CLAUS HEADQUARTERS, SEATTLE, WASHINGTON.

principal was making his rounds, this official met him at the door of the paint room, and as he called attention to the big display of finished toys, the hundreds of variously colored wheels strung on wires across the room, the great piles of red and yellow wagon gears, the long rows of chairs, tables and jumping-jacks, and finally

have been made use of. One year, the representatives of the several benevolent institutions of the city were invited to come and help themselves to what they could use. Another, the pupils divided our section of the city into thirty-six districts, listing the children therein with their ages, the boys themselves attending to the



NEW AND REPAIRED TOYS.

the line of busy painters bent over toys in various stages of decoration, he remarked proudly, "I have sole charge of this entire department." And it was no boyish attempt to be witty, but was deadly serious, and indicated just pride and a realization of heavy responsibility, and a vision that it would not be unwise to encourage.

We usually get out toys in dozen lots. As each of the foremen completes his part of the work, he checks off on a work sheet posted in the shop, so that reference to this sheet, at any time, indicates the progress of the work as a whole and of each separate toy then in the making. When the stock keeper has checked out the last dozen of any toy parts, he removes what remains to the storeroom for next year, and in their place arranges the finished toys, so that when the work is done, he has the completed output pleasingly grouped on his display shelves. An invitation is sent to the teachers of the building to bring their children to view the display before being disturbed.

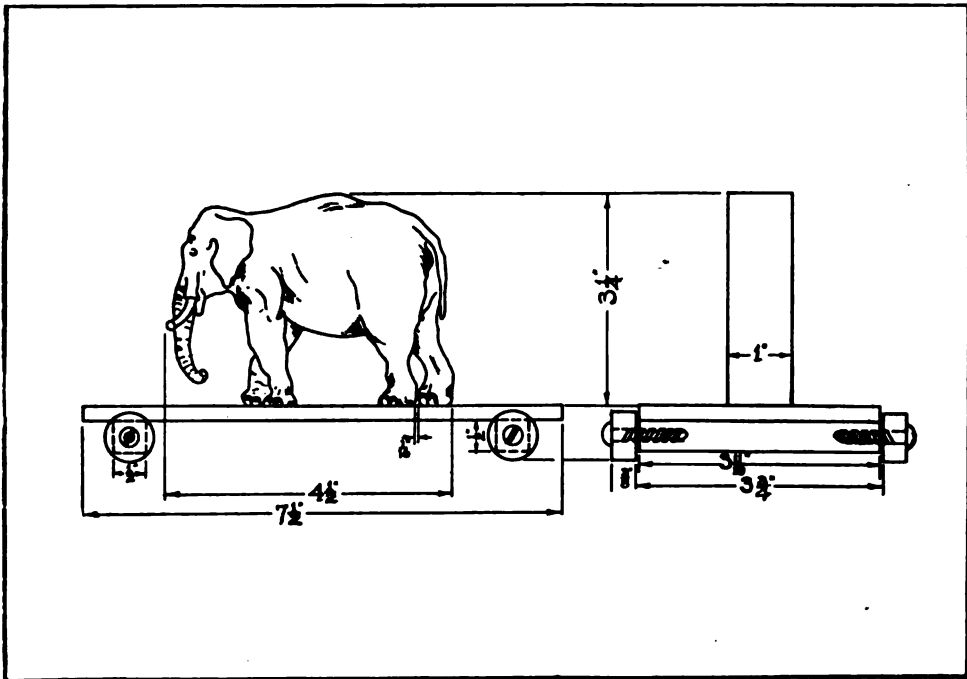
Different methods of disposing of the toys

distribution. Last year the entire lot was turned over to one of the daily papers, which gladly accepts contributions to its yearly Christmas festival to the poor.

Possibly technic and accurate workmanship suffer a little in an undertaking of this kind. If so, there are compensations. Important among them is the training afforded by participation in efficient organization, and acquaintance with the factory system.

Opportunity for invention and incentive to original work are continuous from the drafting room to the paint shop. Scores of handy jigs were worked up and used in duplicating parts on the saws and drills, and ingenious devices made assembling rapid and accurate.

The development of the community spirit is not the least valuable of the results that may be expected. The boys soon come to realize that they are parts of a whole; that the success of the enterprise depends upon each one's doing his best. Each one feels the pride of ownership in the undertaking.



ONE OF THE TOYS MADE IN MR. OLSON'S SHOP.

The awakening of a desire to do for others less fortunately situated than oneself is a result the value of which should not be minimized. We had in our toy-making class, one year, two particularly obstreperous youths. They broke the rules. They were the despair of teachers and principal alike. They sauntered in late of a morning, knocked the ashes out of their pipes against the newel post and shuffled upstairs. But the toy-making finally enlisted their interest. Toward the end of the season, they hunted up several poor families in distant parts of the city, and on the morning of Christmas, walked several miles to deliver the toys they themselves had helped to make, and afterwards told, with some feeling, of the joy their gifts had brought.

—SAMUEL C. OLSON,
Seattle, Washington.

REPAIRING TOYS AT THE FRANCIS W. PARKER SCHOOL.

THE plan of centering the manual arts activities during the weeks just preceding the Christmas holidays, around the manufacture and repair of toys, has been extensively employed during the past few years. In the

Francis W. Parker School the greatest benefit has been gained by organizing the work during these few weeks on a factory basis—a "Santa Claus Toy Shop"—with all the various departments: painting, woodworking, lathe, metal-work and soldering, box-making and packing, doll hospital, etc. In some one of the departments even the youngest and most immature pupil finds a place, while much of the repair work puts to the test the skill and ingenuity of the best worker. Pupils from the higher grades assume the role of foremen of the various departments and direct the work of the younger pupils.

In our request for outgrown toys and for those in need of repair the response has been most generous and the supply has seemed well nigh inexhaustible, to such an extent, in fact, that most of the time and energies of the youthful "hands" in the factory have been devoted to this form of work. We have, however, found time to manufacture some new toys. These have been considered from the standpoint of their adaptability to factory methods of production, providing a variety of processes of greater and less degree of skill. The accompanying drawings show two such toys



SOME OF SANTA'S HELPERS, FRANCIS W. PARKER SCHOOL.



THE PAINTING DEPARTMENT, FRANCIS W. PARKER SCHOOL.

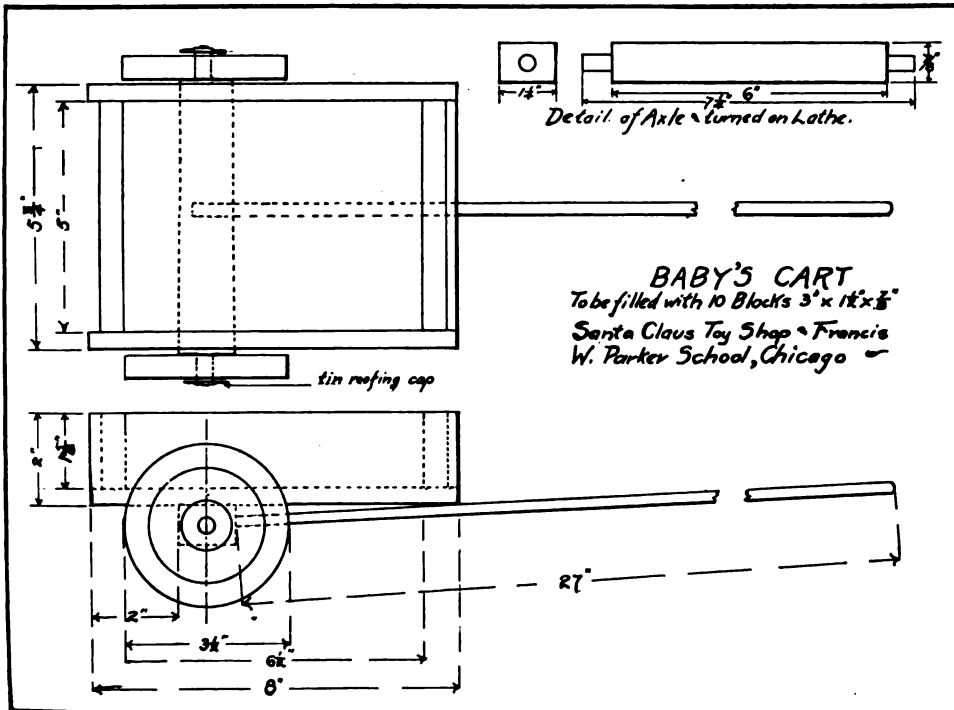


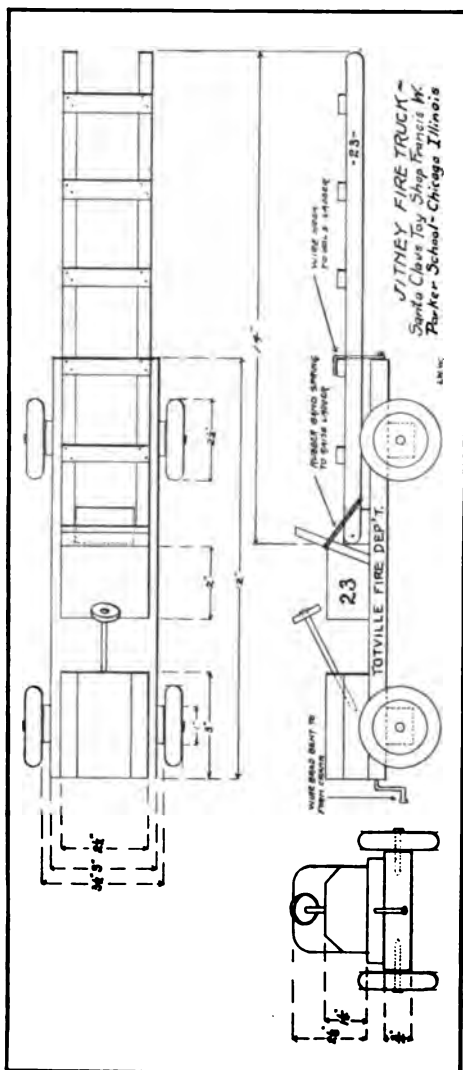
SOME "REJUVENATED" TOYS, FRANCIS W. PARKER SCHOOL.

which have proved very successful. The Francis Parker School has a standing order to supply dozens of the carts to certain of the Chicago settlements, and the "jitney" fire truck has been an interesting project to work out and also to play with.

In these toys a repetition of many processes, such as planing, sawing and nailing is provided and the possibility of using simple aids, similar to jigs used in factory production, is not lost sight of. Thus, gages are devised to in-

sure proper spacing of nails and placing of parts. Jigs are made to insure boring holes at the right angles, and quantity production is aimed at in making certain parts, such as the radiators, seats, axles, etc., which are planed up in one piece and sawed to length in a bench-hook with a stop or gage to insure correct length. The similarity of the radiator in the fire truck to that of a well-known popular make of car has been commented on by the pupils. This thought has no doubt stimulated ingenuity





in devising aids to gain the same efficiency and speed of production for which this car is noted.

A great deal of pleasure awaits the manual arts teacher who has not adopted this work as part of his year's program. In these troublesome days when the cry of economy is heard on all sides, with the shortage of toys due to the war, and with the industries bending every effort toward activities centering about the war, let us see that the manual training shops thru-

out the country "do their bit" to the end that Christmas, the children's festival of the year, may hold its full measure of joy for every child thruout the length and breadth of our land. The spirit of good will and pleasure derived from the work by pupils and teachers alike, prove very decidedly that "the gift is to the giver and comes back most to him."

—L. W. WAHLSTROM.

Note: The plan of organizing a "Santa Claus Toy Shop" was fully described in the *Manual Training Magazine* for December, 1911, and in the "Year Book of the Francis W. Parker School" for June, 1912. A reprint of the latter article may be had by addressing L. W. Wahlstrom, 330 Webster Ave., Chicago.

TOPSY TURVY.

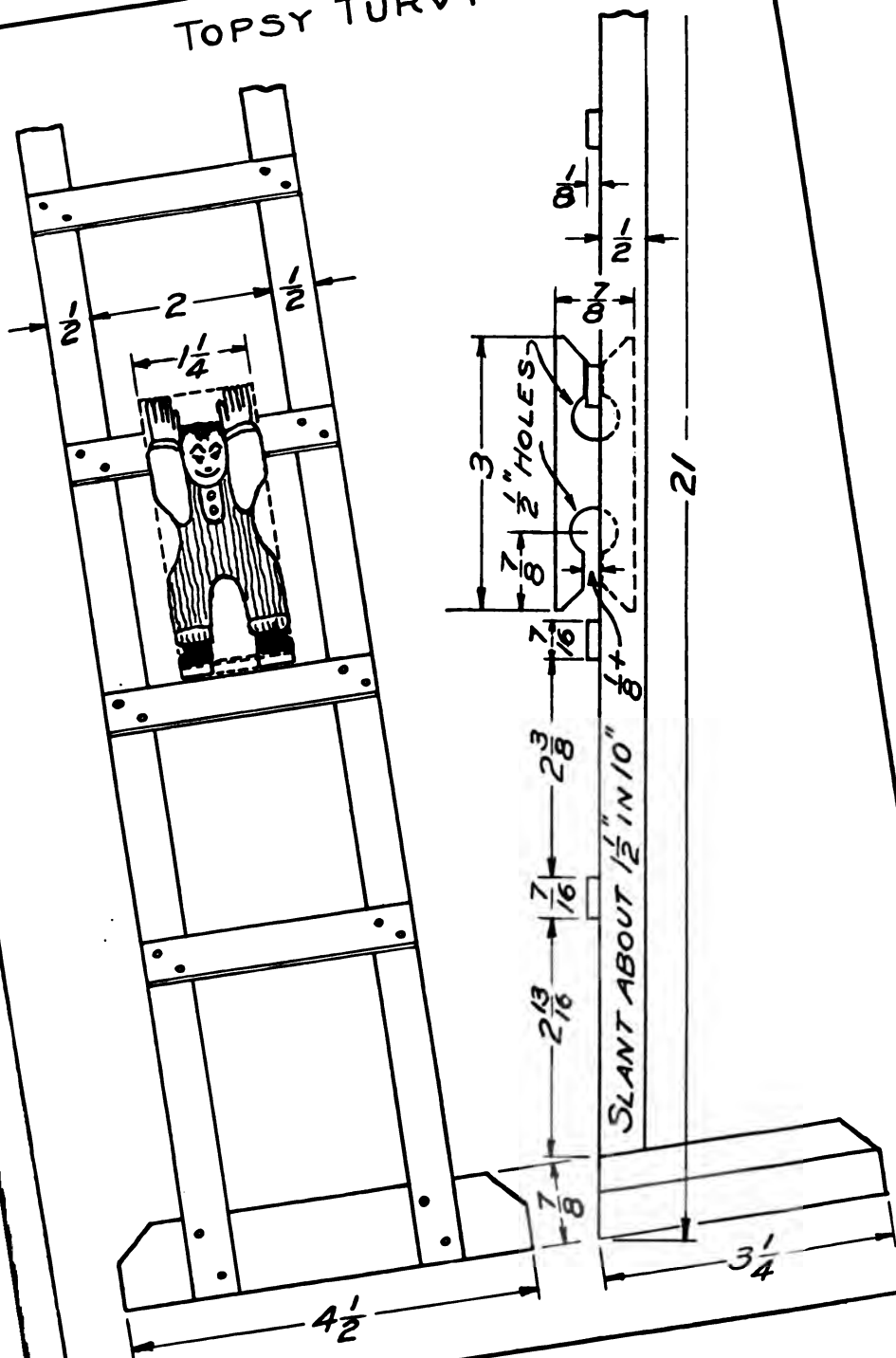
Topsy turvy is a toy action which cannot help appealing to boys of the elementary grades. The slats of the ladder should be of soft wood to avoid splitting in nailing. The block may be either cut to the contour of the little man or may be left rectangular in form. The standard may be either vertical or slanted as shown in the drawing. The object of the slant is to speed up the action and avoid the possibility of the little man balancing on top of one of the slats.

Miss Helen E. Cleaves, of Boston, contributed the drawing of the little man whom we may call "Smiling John."

Note: A number of photographs and drawings of toys which were contributed for this number came in late, and when all were brought together they made too much material for the available space. On this account several more jolly toys will appear in the January number.

"A Tinker I am, Oh, a Tinker am I,
A Tinker I'll live, and a Tinker I'll die.
If the King in his crown, wished to change
places with me,
I'd laugh, so I would, and I'd say unto he,
A Tinker I am, Oh, a Tinker am I,
A Tinker I'll live, and a Tinker I'll die."

TOPSY TURVY



G.M.M.

CURRENT PUBLICATIONS

Practical Concrete Work for the School and Home, by H. Colin Campbell, editorial bureau of the Portland Cement Association, and Walter F. Beyer, formerly assistant engineer, Isthmian Canal Commission. Published by the authors at 824 North Ridgeland Ave., Oak Park, Ill., 1917. Size $5\frac{1}{2} \times 7\frac{3}{4}$ in.; 164 pages; 122 illustrations; price, \$1.50.

This is a book and classroom manual prepared by men of the highest standing in the field it represents. Mr. Campbell is probably the best-known writer on the popular phases of concrete to-day.

Heretofore it has been very difficult for the teacher to secure the information desired on the fundamentals of concrete construction. This book will change this situation, for each topic is approached from the viewpoint of a beginner, yet with the authority of an expert. It treats of materials, forms, tools, principles of reinforcing, proportioning of mixtures, mixing, surface finish, foundations, walls, walks, floors, tanks, posts, blocks, hardening concrete products, etc.

It is a good example of the type of book—scientific and full of practical details—that is being called forth by the movement for vocational education.

Practical Furniture Making, Volume II, by Louis Caldwell Dewey. Published by the Dewey Blueprint Co., Denver, Colo. Size, $3\frac{3}{4} \times 6\frac{3}{4}$ in.; 100 blueprint pages; price, \$1.25.

This is book seven of the "Woodwork Series" of little blueprints of working drawings for shop use. The 100 prints are neatly bound in a ring binder with heavy cloth-covered board covers. Mr. Dewey has rendered a service to manual training teachers by issuing these books of prints.

Sheet Metal Work, by Marion S. Trew and Alfred P. Fletcher. Washington Junior High School Press, 1917. Thirty sheets bound in paper covers with brass fasteners.

This series of school problems in sheet metal work is conveniently arranged. Each problem is presented by means of (a) sketches or working drawings or both, (b) specifications, and (c) steps in the process of construction. Questions are added after each problem, and space is left for notes. If extended notes are to be taken, extra pages can be inserted.

The problems are intended to cover the fundamentals of standard practice in the subject.

RECEIVED.

The Boy and the School, a partial survey of the public schools of Fort Dodge, Iowa. By Edward T. Snively, Engineering Extension Department Bulletin No. 32. Published by the Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa.

Desirability of Vocational Education and Direction for Disabled Soldiers, by Elizabeth G. Upham, director of art department, Milwaukee-Downer College. Bulletin No. 3. Vocational Series. Issued by the General Information and Welfare Section of the Extension Division of the University of Wisconsin, Madison Wisconsin. Price, 10 cents.

Industrial Art at Home and Abroad, by James Parton Haney, director of art in the high schools of New York City. This is a reprint of an address given before The Chicago Association of Commerce. Published by The Prang Company, New York.

The Co-Operative Industrial Course of Study in the High School, York, Pa. This is a reprint from the catalog of the York Public Schools for 1915-16. It is illustrated by photographs of students at work and by pictures of the factories cooperating with the public schools.

Health Charts, by Dr. Thomas D. Wood. This is a report of a joint committee of the National Council and the American Medical Association. It is issued from the press of the American Medical Association, 535 North Dearborn Street, Chicago.

Mooseheart Year Book. 1916-17. Issued from the Mooseheart Press, Mooseheart, Illinois. This is an interesting illustrated account of the activities at the famous school supported by the Loyal Order of Moose. Matthew P. Adams, Superintendent.

Manual Training Course of Study for Grammar Grades. This is printed in the course of study of the public schools, Houston, Texas, 1916-17.

MANUAL TRAINING MAGAZINE

JANUARY, 1918

THE JUNIOR HIGH SCHOOL AND INDUSTRIAL EDUCATION.

WILLIAM NOYES.

Director of Industrial Education, Duluth, Minnesota.

WITHIN the last five or six years there has been an increasing recognition on the part of school masters of the fact that children were dropping out of the upper grades of school at an alarming rate.¹ In pondering over this situation, the educator saw that the eighth grade is not a natural breaking point in school life. Yet both law and custom seemed to make this a sort of node or punctuation point; and hence the highest ambition of many children and of their parents for them was simply that they should finish the eighth grade. Then they stopped.

Yet from a physical and psychological point of view the age of fourteen or fifteen is not the period of great change in the boy and girl. Adolescence begins earlier than that. The great change comes between ten and thirteen; that is, beyond the sixth grade. If a change in arrangement of courses and in method of teaching is desirable, it should come then. Hence, it was conceived, that a natural and normal division of school life would be a six-year elementary school, a three-year junior high school, and a three-year senior high school, the so-called 6-3-3 plan. The adoption of this plan, it was hoped, would break the habit of thought and practice that a natural stopping place was at the end of the eighth grade, and many would be induced

to keep on in school for another year and finish the junior high school; a thoroughly sound idea so far as it went.

As the situation was studied more deeply, it became a matter of conviction that there were deeper causes of school mortality than the custom of stopping at the end of the eighth grade. Many drop out of school at the end of the seventh grade and sixth grade and even the fifth grade, if the law allows. It is apparent that there is frequently—too frequently—a weariness of school life. Educators are face to face with the question: Does school, to an ominously large number of children, become more and more irksome? Is there on the part of children and parents a feeling of futility in school, a sense of merely marking time, a lack of the consciousness of accomplishment, and of a sense of success?

No one who has ever tested the joy of accomplishment, the sense of success, can doubt that misery and dullness of existence come with lack of achievement. Yet that is what the ordinary life of the school child has been.

Boredom is a horror to all healthy, active persons. Many a child, perhaps most children are bored by school life, and especially in the upper grammar grades. They feel that they get nowhere.

They may be encouraged to keep on; they are inculcated with the belief that

¹See Ayres', *Laggards in Our Schools*.

they are preparing for life later. School life is commonly presented to them as getting ready to live. If this were true, hope and encouragement might be possible. But children and their parents have been becoming more and more suspicious that they are not getting ready to live. Even if, for the sake of general culture, they are willing to postpone specific preparation for earning a living, economic preparedness, there is a growing distrust on their part of the value of the general culture offered to them. Hence, we have the spectacle of public dissatisfaction with the public school, as being detached, ineffective, and impractical. The public school, without exception the most highly prized of all our institutions, is under fire.

Along with this hope of keeping children in school longer was the growing conviction on the part of educators that the curriculum itself needed overhauling. Some subjects, as foreign languages, should, it was felt, be begun earlier than the high school. Individual requirements demanded earlier differentiation of courses. The common practice of drill and routine, forcing all children into the same mould should be supplanted, it was thought, by a system which allowed greater freedom of individual choice. It was recognized that the elementary school was not fulfilling, on the one hand, its function of preparing for high school, nor on the other hand, for citizenship or industry.

The frank recognition of such facts as these on the part of leading educators is leading them to reorganize the school system, its divisions, its curricula, its methods of teaching.

This judgment of educators of the need of reform has been paralleled by the opinions of employers of labor. In their experience, children come from school ignorant, untrained, undisciplined. Their reaction to the situation has been largely a movement for specific industrial train-

ing. We may grant without question that the view of many employers is narrow and selfish. What many of them wanted was careful, accurate, swift operators, and they thought the public schools ought to train them.

Now what was the answer of the school man to this demand of the employer, to the need of industrial preparation?

1. In the first place and negatively he replied, "We will not forego our right and duty to impart culture. The public school is and shall remain the great communal means of imparting to coming generations our common ideals and of developing intelligence. Since we believe that education is the process by which one generation transmits its spiritual inheritance to the next generation, we hold inviolable the function of the public school to pass along the lamp of learning.

2. In the second place the schoolmaster is thinking and thinking constructively of the importance of making use of the great resources of industrial experience as a fund of knowledge to be applied to practical and cultural purposes. He is thinking of the need of constant and abundant interest in school life, of the value of living *all* the time, in childhood as well as adulthood. He has thought and is still thinking about these problems and his tentative answer is the junior high school. Already evidence is gathering that this plan will reduce pupil mortality.²

If the junior high school had done nothing more than increase enrollment from the seventh grade up, most teachers would feel that its existence was justified. But it could not do that without doing more, because the change has been brought about by internal improvement, not by external compulsion. Better school laws,

²See Douglas in "*The Fifteenth Year Book of the National Society for the Study of Education.*"

more strictly enforced, a more efficient truant officer service may increase school enrollment and attendance, but unless the school itself becomes more attractive and valuable, the result is only a smothering of discontent and the breeding of underground dissatisfaction.

It is the glory of the junior high school plan that it has arisen out of the study of needs of the adolescent child, that it is a constructive effort to bridge the gap between the elementary school and the high school, by vitalizing the curriculum.

Let us see how it is doing this. I have spoken of the junior high school as being the schoolmaster's tentative answer to some of the modern problems of school life. Tentative because the junior high school is still in an experimental stage. This is shown by the great variety of forms which it has assumed in this country. Which form will survive, it is perhaps too soon to say, but among all the varieties, three types are coming to be distinguished.

Passing over the most superficial change, which, in some instances has been one of mere form, in which the ninth grade is dropped down into the elementary school and the seventh, eighth, and ninth grades called a junior high school, we note one type (A) in which the teaching has been departmentalized, each teacher having but one or two subjects, and in some instances the curriculum has been changed so as to eliminate some drill and repetition of subjects which had already been studied earlier, and the introduction of certain other subjects, as general science and languages. In many such junior high schools there has been no change either in the amount or the method of industrial work—manual training and home training.

In what I will call type B, the idea of specialization has been the determining factor. That is to say, just as in many senior high schools, there is a college preparatory course, a scientific course, an

agricultural course, a commercial course, an art course, a manual training course, and a domestic science course, so a similar differentiation is provided in the junior high school. Certain subjects as English, social science, and mathematics are required of all pupils, and then each pupil elects at this early age, some more specific kind of training. In other words the boy and girl and their advisers decide, so far as they can, when he or she enters the seventh grade whether he or she shall go to college, to the farm, to the counting house, to the kitchen, to the factory, or to the studio. With our easy going American habits, this is not done with any such inexorability as obtains in the Prussian system, but the general principle is that of early decision as to vocation.

That such courses are called optional should not divert attention from the fact that the effect of such an arrangement is early choice and specialization in vocational lines. In an extreme form even the English and mathematics are specialized to the particular curriculum chosen.

Girls, of course, are expected to choose the home training course, and receive specialized training to a greater degree than even the boys.

This plan is practically an abandonment of the traditional American idea that the main function of the public elementary school is general culture.

The justification for such specialization is that most of the pupils, especially in city schools, will not go to high school anyway, and hence they are better fitted for their life work by some specialized training for it, even at the early age of thirteen to sixteen.

In this type of junior high school the industrial course may be still further subdivided, and the boy decide early whether he shall specialize in woodworking, metal-working, printing, electricity, agriculture or whatever other courses may be offered.

That is, even here the emphasis is placed and encouragement given to early choices.

A third type of junior high school, C, is based on the principle that the boy and girl should have as great a variety of experience as is practicable, and that definite vocational choices should be deferred as long as possible. In its extreme form, the pupil would pass thru a cycle, not only of industrial but also of commercial, agricultural, artistic, and academic activities. It assumes that at the age of early adolescence, it is impossible to foresee what the predilections and abilities of any child, boy or girl, are going to be.

In America, more than in any country in the world free vocational choices are possible, and examples are constantly brought to our attention of men, and to a less degree of women, who try one vocation after another before settling into their life work. And if we grown-ups keep changing for so many years, by what right should we impose a choice on children under fifteen? The school, according to the advocates of this type should be kept "wide open." Reduced to practicable terms, this plan involves the following features:

1. It is prevocational in the widest sense of the term, not merely in application to certain mechanical industries. If it is proper and wise for the boy to go thru experiences in certain manufacturing industries, such as sheet-metal work, plumbing, forging, machine shop, electrical work, cabinet work, carpentering, wood-turning, pattern making, concrete work, printing, cobbling, or whichever ones it is feasible to include, it is equally wise for him, if it is feasible, to have some experience in plant culture, in commercial processes, and we may at least ask, why not in textiles, in cookery—we have had in Duluth some very enthusiastic boys' classes in cookery. But why stop here? Is it possible to give boys and girls some idea while they are in the junior high

school of what the so-called academic subjects lead to vocationally, some conception of scientific activities, of the engineering, medical, legal, pedagogical, political, or socially ameliorative professions?

In a sense the professional fields have been the ones to which all school life has pointed hitherto. The elementary school has been aimed at the high school, the high school at the college, the college at the so-called higher professions. The junior high school that some of us have in mind tries to prepare for the widest possible choice, and to put the pressure toward no single sort of vocation. I do not say that this is entirely practicable, but many are convinced that we can go much farther in this direction before we exhaust the possibilities of school administration.

We are already taking steps in that direction. We are throwing the school doors wide open to all sorts of vocational activities. If this general principle is correct, and if its application is possible, certain conclusions seem to follow.

1. Industrial education is not a thing in itself. My subject, "The Junior High School and Industrial Education" is to be conceived and understood only in relation to the larger problem of the relation of all education to vocational preparation. The junior high school is to be thought of as a prevocational school in no narrow but in a wide sense of the term. That the industrial phases of it will assume a large importance is evident for the simple reason that industry is the indispensable foundation of living, and of good living.

2. If a boy can have experiences, and see the meaning, during his junior high school life, of typical modern vocations—agricultural, manufacturing, commercial, and to even a little extent professional, he is laying the foundations for his vocational guidance, firmer than any he can otherwise gain. If, as we believe, experience is the best guide and teacher, then vocational ex-

perience of some sort will prove to be the best sort of vocational guidance. No amount of second hand knowledge gained thru reading or the advice of adults can compare in value with actual dealing with the concrete materials and processes of various vocations for helping the youth to find himself and choose his vocation.

3. If the junior high school is to be truly and thoroly prevocational, it would seem to be inevitable that the senior high school should become more distinctively vocational. In place of the present diletante objectiveless courses that obtain in many high schools, particularly the so-called manual training high schools, there are bound to come, as there are coming, into existence industrial vocational schools, that lead directly to definite vocations, just as at present agricultural courses and commercial courses and college courses and some technical courses do.

In conclusion, one cannot shut his eyes to the immense practical difficulties and

problems involved in putting into effect a truly broadly conceived junior high school, such as the determination of the best size of the class unit, and of the economical size of a single junior high school, the close relation necessary between the shop and the classroom work, the securing of properly trained teachers, and the education of the community to the large and invaluable principles involved. These include the principle of real vocational guidance, the principle of the ultimate identity of culture and industrial education, the principle of the moral values of making school life interesting and worth while, and the principle of the ultimate unity of all our educational problems.

There is a long arduous task before us to organize the junior high school so as to become an integral part of our educational system, but it is my conviction that in adopting the principle of the wide open prevocational school we are facing toward the light.

A NEW SYSTEM OF RECORDS AND CERTIFICATES FOR VOCATIONAL SCHOOLS.

EUGENE C. GRAHAM.

Director of Industrial Arts, Evansville, Indiana.

NOT much attention is paid to the ordinary school diploma by a prospective employer. In his estimation it is simply a formal notice that the pupil has completed a course of instruction in a school. It may be suitable for framing or for presentation at a college as an evidence of graduation, but it does not give any information as to the character of the work done.

In order to encourage the boys in our vocational courses to appreciate the records they are making in school, and to provide them with a certificate which they may present to an employer I have worked out a system which practically explains itself.

Each certificate, Figs. 1 and 2, represents the work done in one department according to a unit system. Each vocation is analyzed, and the shop and school experience arranged in eight groups.

The record cards, Figs. 3, 4 and 5, correspond to the groups on the certificates, and contain the analysis of operations on the machines or the outline of the subject-matter to be covered in the school work. Since these cards are for the inspection of employers in the industries they offer more detailed information on the shop side than on the school side of the course. No attempt is made to grade in percentages. If a boy is considered proficient in an op-

The Evansville Vocational School

Department of
Furniture and Mill Work

Certificate of Experience and Training

This is to certify, that _____
has completed to the satisfaction of his instructors the units of Shop Experience and School Training indicated herewith. He has an attendance record of _____ days.

Preparation of Stock Handling rough lumber from stock to the cabinet maker. Routing material from machine to machine, trucking and stacking. _____ Instructor	Machine Operation Group I The Universal Saw The Single Surface The Jointer. _____ Instructor	Machine Operation Group II The Band Saw The Belt Sand- er The Mortiser The Taperer. The Lathe The Boring Machine. _____ Instructor	The Use of Hand Tools Planing, scraping, and sanding. The hand saw, chisel and boring tools. All tools used in assembling. _____ Instructor
School Training English _____ Civics _____ Industrial History _____ General Science _____ Shop Arithmetic _____	Wood Finishing Staining and Filling. Varnishing Hand rubbing. The use of oil and wax. _____ Instructor	Assembling Case Work and Cabinets. Chairs and Tables. Veneering and the Use of Glue. _____ Instructor	Supplementary Work Mechanical Drawing _____ Furniture Design _____ Use of Steel Square _____ Problems in Carpentry _____

IMPORTANT
Credit is given only for work checked and signed by the individual instructors

MEMBERS OF SCHOOL BOARD

"Perseverance Brings Success"

DIRECTOR VOCATIONAL EDUCATION

Evansville Indiana High School Press

FIG. 1. (PRINTED ON A SHEET 9 1/4 x 12 IN.)

The Evansville Vocational School

Department of
Machine Shop Practice

Certificate of Experience and Training

This is to certify, that _____
has completed to the satisfaction of his instructors the units of Machine Operation and School Training indicated herewith. He has an attendance record of _____ days.

The Engine Lathe General and quick change types. A large variety of work between centers, on the face-plate and in chucks. Grinding and setting of tools and care of the lathe. _____ Instructor	The Drill Press General light and heavy drilling, tapping, reaming and boring. Instruction in drill grinding, feeds, speeds and laying out. _____ Instructor	The Universal Grinder Internal and external finish grinding. Flat surface work and tool and cutter grinding. _____ Instructor	The Universal Milling Machine Plain and universal milling, slotting, indexing, gear cutting, and the use of the vertical head. _____ Instructor
School Training English _____ Civics _____ Industrial History _____ General Science _____ Shop Arithmetic _____	The Planer and Shaper Planing on table and in vise. Planer feeds and speeds, tool grinding, use of clamping bolts, jags and fixtures. _____ Instructor	Bench Work--Assembling Laying out, chipping and filing. Use of scraping tools, hand taps and fitting of bearings. _____ Instructor	Supplementary Work Forge Shop _____ Pattern Making _____ Sheet Metal Work _____ Mechanical Drawing _____

IMPORTANT
Credit is given only for work checked and signed by the individual instructors

MEMBERS OF SCHOOL BOARD

"Perseverance Brings Success"

DIRECTOR VOCATIONAL EDUCATION

Evansville Indiana High School Press

FIG. 2. (PRINTED ON A SHEET 9 1/4 x 12 IN.)

OPERATION RECORD L	OPERATION RECORD D
Name _____ ENGINE LATHE ☐ Quick change ☐ Geared type A. Turning on centers ☐ Straight turning ☐ Thread cutting ☐ Taper turning B. Turning work on faceplates ☐ Mounting ☐ Drilling ☐ Boring ☐ Reaming ☐ Internal thread cutting C. Turning work in chucks ☐ Centering ☐ Drilling, boring and reaming D. General knowledge ☐ Of taper attachment ☐ Of speeds, feeds and gearing ☐ Of regular and special tools ☐ Of chucks, rests and centers Evansville Vocational School <i>Department of Machine Shop Practice</i> Date of lesson referred _____ Instructor _____ Director _____	Name _____ 20" DRILL PRESS A. Drilling on table and in vise ☐ Laying out holes ☐ Plain drilling ☐ Drilling in jigs ☐ Counter sinking and facing ☐ Boring and reaming ☐ Tapping ☐ Drill grinding B. General knowledge ☐ Of speeds and feeds ☐ Of straps, bolts and angle plates ☐ Of chucks and collets ☐ Of cutting compounds ☐ Of attachments for special work _____ _____ Evansville Vocational School <i>Department of Machine Shop Practice</i> Date of lesson referred _____ Instructor _____ Director _____
Name _____ BATH UNIVERSAL GRINDER A. Grinding Between Centers ☐ Plain cylinders ☐ Tapered work ☐ Setting up for work B. Tool and Cutter Grinding ☐ Milling cutters ☐ Reamers C. Flat Work ☐ Grinding parallels ☐ Grinding straight edges D. Internal Grinding ☐ Straight holes ☐ Tapered holes E. General Knowledge ☐ Of speeds and feeds ☐ Of grinding wheels ☐ Of cooling liquids Evansville Vocational School <i>Department of Machine Shop Practice</i> Date of lesson referred _____ Instructor _____ Director _____	Name _____ BATH UNIVERSAL GRINDER A. Grinding Between Centers ☐ Plain cylinders ☐ Tapered work ☐ Setting up for work B. Tool and Cutter Grinding ☐ Milling cutters ☐ Reamers C. Flat Work ☐ Grinding parallels ☐ Grinding straight edges D. Internal Grinding ☐ Straight holes ☐ Tapered holes E. General Knowledge ☐ Of speeds and feeds ☐ Of grinding wheels ☐ Of cooling liquids Evansville Vocational School <i>Department of Machine Shop Practice</i> Date of lesson referred _____ Instructor _____ Director _____

FIG. 3. VOCATIONAL SCHOOL RECORD CARDS.

OPERATION RECORD M	SCHOOL RECORD S	OPERATION RECORD P
Name _____ CINCINNATI UNIVERSAL MILLING MACHINE A. Plain Milling ☐ Flat work, sawing and slotting ☐ Side, end and angular milling ☐ Rack cutting B. Use of the Dividing Head ☐ Milling flats ☐ Plain and spiral fluting ☐ Cutting spur and bevel gears ☐ Use of the vertical head C. General Knowledge ☐ Of speeds and feeds ☐ Of clamps, straps, parallels, angle plates and collets ☐ Of plain and compound indexing Evansville Vocational School Department of Machine Shop Practice Date of leaving school _____ _____ Instructor _____ Director	Name _____ SCHOOL RECORD ☐ English I ☐ English II ☐ English III ☐ English IV ☐ General Science I ☐ General Science II ☐ Shop Arithmetic I ☐ Shop Arithmetic II ☐ Civics ☐ Commercial Geography ☐ _____ ☐ _____ ☐ _____ Evansville Vocational School Department of Machine Shop Practice Date of leaving school _____ _____ Instructor _____ Director	Name _____ 24" GRAY PLANER A. Planing on bed and in vise ☐ Horizontal ☐ Vertical ☐ Taper ☐ Angle ☐ Slotting ☐ Key Seating B. General knowledge ☐ Of Attachments ☐ Of Speeds and Feeds ☐ Of Straps, Clamps and Bolts ☐ Of Special Jigs ☐ Of Regular and Special Tools ☐ Of Surface Gauge, Protractor and Depth Gauge C. Record of special work done _____ _____ _____ Evansville Vocational School Department of Machine Shop Practice Date of leaving school _____ _____ Instructor _____ Director

FIG. 4. VOCATIONAL SCHOOL RECORD CARDS.

Each of the above is printed on a sheet of heavy paper 3¾x7½ in.

OPERATION RECORD B Name _____ BENCH WORK—ASSEMBLING A. Bench and Vise Work ☐ Laying out ☐ Chipping and filing ☐ Scraping ☐ Hand reaming, tapping and threading ☐ Babbiting ☐ Brazing and soldering B. General knowledge ☐ Of hand tools ☐ Of rules, calipers and gauges ☐ Of allowances in fitting ☐ Of the care of tools C. Record of special work done _____ _____ Evansville Vocational School Department of Machine Shop Practice Date of leaving school _____ _____ Instructor _____ Director _____ C. H. S. Press	OPERATION RECORD R Name _____ RELATED WORK A. Forge Shop ☐ Welding ☐ Tool making and tempering ☐ Case hardening B. Pattern Making ☐ Solid patterns ☐ Split patterns ☐ Cored work C. Sheet Metal Work ☐ Soldering ☐ Pattern drafting ☐ Simple construction D. Mechanical Drawing ☐ Projection drawing ☐ Detailing ☐ Machine sketching _____ Evansville Vocational School Department of Machine Shop Practice Date of leaving school _____ _____ Instructor _____ Director _____ C. H. S. Press	OPERATION RECORD 4 Name _____ THE USE OF HAND TOOLS 1. Common Practice in Hand Planing ☐ Block and smooth planes ☐ Jack planes and jointers 2. Hand Scraping and Sanding ☐ Practice in scraping and sanding 3. The Use of Saws ☐ Practice in ripping by hand ☐ Cross cutting with hand saw ☐ Coping and compass saws 4. Chisels ☐ Practice in mortising by hand ☐ Work with chisels and gouges 5. Auger Bits and Wood Drills ☐ Common practice 6. General Knowledge ☐ Of nails and screws ☐ Of cabinet hardware ☐ Of clamps and hand screws ☐ Of laying out work ☐ Of tool grinding Evansville Vocational School Department of Furniture and Mill Work Date of leaving school _____ _____ Instructor _____ Director _____ C. H. S. Press
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FIG. 5. VOCATIONAL SCHOOL RECORD CARDS.

eration on a machine a conductor's ticket punch is used to indicate the fact. Work cards and weekly shop reports are required from pupils and the items on these reports give the instructor a running record which may frequently be entered on the operation record cards. The school record may be entered at the close of the term or when the boy leaves the school.

Some of the advantages claimed for this system are as follows:

1. The record advertises the course offered in the school.
2. The record is of interest to the prospective employer since it tells him what the pupil has done.
3. The certificate may be given when only part of the course has been completed without discredit to the school and per-

haps with great advantage to the boy who is compelled to drop out. Additional credits may be added later by part-time or evening school work.

4. The certificate and all record cards contain instructors signatures.

5. The instructor has at all times in his possession a systematic record of the operation each boy has mastered, and can advance him from machine to machine as soon as the record is entered.

6. The system is readily adaptable to unit courses. In fact it is itself a unit course record.

7. Since there is no time limit on the certificate the boy who is anxious to get ahead may get his operation records filled out earlier. The system puts a premium on industry.

Education offered purely for its disciplinary value, or as a preparation for college only, does not fulfill its real mission and purpose, since it affects but a small proportion of those who are entitled to every possible benefit. The high school that is really desirous of meeting the real professional and business requirements of to-day must place a special emphasis on specific education and training, whether for the professions, commerce or the industries.—FRANCIS L. BAIN.

PREVOCATIONAL EDUCATION IN SEATTLE PUBLIC SCHOOLS.

EDWARD G. ANDERSON.

Teacher in an Industrial Center, Seattle, Washington.

IN the year 1911 Mr. Ben W. Johnson, supervisor of Manual Arts in the Seattle public schools established prevocational centers in three of the public schools, allowing two hours each day for shopwork in the seventh and eighth grades. This

trial courses have held their own in the high schools with those graduated from the academic courses. This in spite of the fact that during the first two or three years of the experiment the course was regarded as one for the children more or less



OFFICE, GREEN LAKE INDUSTRIAL CENTER, SEATTLE. BOYS REMOVED PARTITION, TRANSFORMING A DARK, USELESS HALL INTO THIS VALUABLE ADDITION TO THE SHOP.

cut the time of the regular academic work to three hours daily. The experiment proved so successful that the next year six additional centers were established, while in 1914 two more made the total eleven centers where two fifths of the day was given to hand work. Besides these there are three centers where a semi-industrial course is followed, with but one hour devoted to the shop activities.

The natural supposition would be that the academic work would suffer with its shortened program, but this has not followed. The boys and girls in the indus-

of the "dummy" variety. Principals of schools without the industrial shops were a little inclined to send their undesirables to the schools which possessed shops. It is to the credit of these centers that many of these pupils found themselves, and graduated with their classes, when otherwise they would have dropped out long before the eighth grade. Now these centers are established in all parts of the city and the school authorities and the public realize the value of the hand training provided.

To quote Mr. Johnson, "Prevocational

education in Seattle aims to be broadly educational. It represents a new effort to develop a pupil's natural interests and powers in such a way as to contribute most to his intelligence, self-reliance and usefulness. The special work in the industrial arts is not offered on the assumption that those taking it are preparing to

enlarged opportunity in the modified course.

"The shop instruction consists of work intended to give knowledge of materials and their uses, tools and skill in their use, methods of construction, problems in machine and handwork, acquaintance with individual and factory production, the use



TYPICAL POWER MACHINE EQUIPMENT, SEATTLE INDUSTRIAL CENTER, GREEN LAKE SCHOOL.

seek employment at its conclusion. Indeed, the possible prevocational advantages of the work have thus far had very little consideration, and apparently very little influence with parents. The new type of course finds its chief justification in the keener interest, ambition, and industry that it has stimulated in many pupils who found inadequate opportunity for self-expression under the older order. Some of these were not doing well in the regular course, but many were satisfactory students who found a new interest and an

of preservatives, as paints, oils, etc., discussions of the various vocations, monthly visits to work under construction, and to manufacturing and commercial establishments.

"The seventh grade group follows the usual manual training course of that grade—benchwork in wood with mechanical drawing—, but more intensively and extensively. The worth of skill, time and material in using hand tools is emphasized. No machinery is used, tho group work is carried on at different times. The

boys become familiar with the machines in the shop thru taking care of them.

"The eighth grade continues the work in mechanical drawing beside some work in design. In the shopwork the turning lathe and the different woodworking machines are used. This is not taught as class work, but as group work, the boys rotating from machine to machine if found capable and trustworthy with power machinery. A number of weeks is given to factory production in making school furniture. While this is being carried on it is planned to give each boy experience in working different commercial metals. A forge, an engine lathe, and sheet-metal tools are provided. As in the woodworking processes, the boys work in groups first to understand the material and how it is

worked and the purposes for which it is used, and then later, individually upon problems mechanical or electrical that employ the different tools in the shop. Emphasis is placed upon the economic methods used in production in the industries. The sequence of the course is based more upon the development of the idea of a need to be supplied, and the tools, processes and organization necessary to realize it.

"Such prevocational work not only instructs the boy in the 'how to do' of the different materials, tools and processes with which he has to deal, but it also teaches him how to work, how to think thru work, how to co-operate, and it awakens him to the joy of accomplishment."

MANUAL TRAINING SHOULD FUNCTION IN THE HOME.

JOSEPH B. EAGAN.

Principal, Harvard District, Charlestown, Mass., also Editor, "Educational Standards."

THE aim of manual training, as of all other training, is to prepare the child for the solution of the problems of maturity. The excessive working in wood in manual training classes has failed in this regard for the simple reason that working in wood is only one, and a very minor one at that, of the problems bound to confront the youth in the setting up of his own home.

The following list of activities that lie in and about the home life of every child has been compiled from the jobs submitted to me by one class of eighth grade boys as work that needed doing in their own homes, and for the doing of which their parents were about to pay out hard-earned cash. The list represents also the daily jobs which are going to face the boy of the present when he has become the man of the future. The list represents a field of exploration of such fascinating possi-

bilities that the mere contemplation of it arouses in the average boy the highest kind of hopes. It represents variety of work, newness of applied principles, new tools. It emancipates at once the naturally inquisitive mind of the child from the shackles of "face one" and "face two" and opens up for him a world in which he finds he is actually going to do something. As such this list is well worth studying.

Kind of Work	Number of Jobs
Cobbling	5
Glazing	5
Window cords	6
Window shades	
Hanging	5
Springs	13
Tacking	9
Soldering	15
Caning	18
Chair repairs	20
Shelf making	4

Toys for younger children	3
Electric bells	9
Batteries	2
Wiring	4
Picture hanging	7
Painting (mixing paints)	4
Varnishing	8
Book repair work	1
Cement walk repairs	3
Leaking gas jets	11
Use of Asbestos	2
 Total	 154

Thus 154 odd jobs needed doing during the month in question. Twenty-seven boys wanted to learn how to do them. This is a practical condition the significance of which no one can overlook.

The question immediately arises: Can any one child ever hope in two short years to get even an inkling of the mysteries of all these odd jobs? The answer is: He cannot. And the explanation is that he need not, but what he will get and does get in schools where modifications of this plan are already at work is a wide acquaintance with a variety of odd jobs which gradually initiates him into the secret of their accomplishment, and more than all else, gives him a definite opinion that he is quite capable of handling, not only the ones he has actually come in contact with, but any other reasonable job in sight. It is after all the unusual features of a new job that make it terrifying. If the child can once be brought to a realization of what he can accomplish if he only tries, he will have learned the most valuable lesson that the schools can teach.

The plan of operation under which the child can be initiated into the mystery of the new and unknown job is as follows:

Given a seventh grade of average size, an equipment including, besides wood-working tools, a soldering outfit, a cobbler's outfit, some plaster and other in-

redients, cement and sand, and in fact whatever other equipment is necessary—all rather inexpensive since not more than two sets of tools will be required; given also forms covering in miniature the actual working conditions to be met by the child when doing the real job. (By a form I mean a model say of a window, Fig. 1,



FIG. 1. REMOVING A PANE OF GLASS.

with casing, sashes, weights, glass, etc., an old boiler in which holes may be punched and soldered up again, an electric bell, a section of a wall with lathing exposed, a section of a side of a house for instruction in the application of paint, and, of course, any form or model required by the job to be done.) Nine tenths of these models can be made by the boys themselves and from experience I know that the making of them is intensely interesting.

Given all these things, boys are asked to look around at home and bring in a list of at least five jobs, small ones, that need immediate doing. They are not in-

structed as to the character of the work. The fact that the job needs doing is enough. Cards are provided which the boys fill out neatly in ink in their regular grade. They fill out a card for each kind of work; one for soldering, another for plastering, another for shelf building, picture framing, or what not.



FIG. 2. REPAIRING AN ELECTRIC BELL.

These cards are brought into the manual training room and the boys are assigned to the different models or forms. A little system makes this feature comparatively easy. The result is that the entire class is engaged at once in learning how to do some piece of work that each member realizes needs to be done either in his own or someone else's home. The abstract feature of present day manual methods is lost and a concrete interest substituted. The function of the teacher is to pass

from one group of boys to another correcting methods of work, advising as to plans of procedure and where necessary giving a general lesson in the use of some particular tool or operation. Team work, involving the whole class can very readily be done when the question of the mixing paint arises, or the proper treatment of an electric battery is in question. It has been found that in the course of the year varieties of work are duplicated constantly, certain tool kits and forms being in use all the time, showing that the local needs are being met. It has been a great source of surprise and gratification to see how readily a boy absorbs instructions when learning to do a thing he wants to do and which has for him a live interest from the standpoint of utility. A boy likes to think that his work amounts to something; the abstract idea that he is working for the future does not appeal to him very much. He wants to work for the present, and this want of his accounts for a vast misunderstanding of his lack of appreciation of efforts made in his behalf.

When the boy shows to the teacher's satisfaction that he is sufficiently well acquainted with the means of doing the job he has in hand he is instructed to attempt the job that needs doing at home. Where the work is portable, as in the case of a tea kettle or boiler or the framing of a picture, he should be allowed to carry the work to school and do it there. Where this cannot be done the work is performed at home and a card sent along for the parent to sign stating that the work has been done satisfactorily. The teacher thereupon determines the money value of the service rendered and that, too, is entered on the card. At the end of the term the cards representing the various activities the boy has been engaged in are assembled, the money values figured and brought to his attention and the results are tabulated for general school use.

A MANDOLIN THAT YOU CAN MAKE.

CHARLES E. RILEY, JR.

Drexel Institute, Philadelphia, Pennsylvania.

IN making a mandolin, the first thing to consider is the kind of wood to use in order to get the best results. Well seasoned white spruce cut "comb-grained" should be used for the top. This wood has fine sounding qualities, works well, and is durable. For the back, a piece of figured mahogany may be used. The sides and neck are made of a straight and even grained mahogany. Figured mahogany is very undesirable where there is much cutting to be done. The fret or finger board may be made of rosewood or ebony.

The next step is to plane the flat faces of the front and back pieces. See that the plane is sharp and have the cap set down close to the cutting edge. Lay off the shape on these pieces and, with a sharp knife and straight-edge, cut the edges to proper shape. Now cut out the hole, or mouth, in the top. This is done with the aid of the knife and straight-edge, in the same manner as the edge of the top was cut. Go over the line many times so as not to force or split the thin wood. A little band of inlay can easily be fitted and glued to the edges of the mouth.

Now make the battens, or supports for the top and back. Before gluing on the battens, clamp the top and back to a level board so that the hot glue will not curl the pieces and prevent a tight joint. Next make a few long, triangular cross-sectioned pieces. From these, the little pieces to which the sides are glued are made. With a sharp pointed scribe, or pencil, make a fine line parallel to the edges of the bottom piece, one-half inch in from the edge. The triangular pieces are now to be fitted and glued in place. Let each piece

set before fitting and gluing the next piece.

Then plane up two strips to the proper width for the sides. These pieces must be fitted one by one, and glued separately to the side pieces on the bottom. The angles must be determined by trial. If a trimmer is available, the amount of work is greatly reduced. If it is impossible to use a trimmer, the angles may be found and then cut by sawing carefully to the lines. After the sides are glued and set, fit the triangular pieces in place at the top of the side pieces. The top is now ready to be glued and clamped down to the bottom part. After this has hardened, fit the pieces to which the tail-piece and neck are glued, so that they come flush with the edges of the top and bottom. Glue these in place.

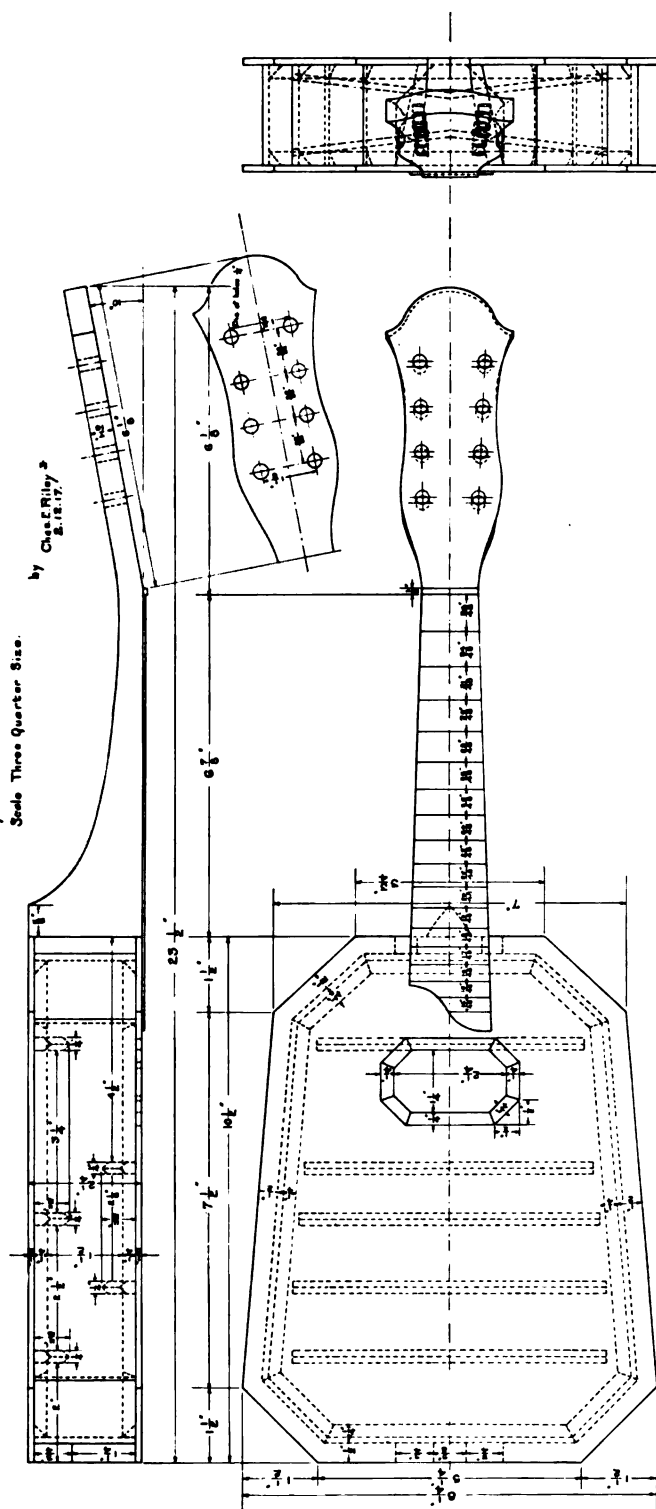
The neck is cut from a solid squared piece. With a scribe, lay off the shape on each side. With the aid of a turning saw, the shape can easily be roughed out. Save the scrap pieces for they will help you hold it in the vise later. Now the neck can be rounded up with a spokeshave. See that the tool is in good order. It is well to have the piece out of which the neck is made squared on all sides, with one end squared with the front face. This gives a flat end, which is retained for gluing to the body. Before gluing the neck to the body, glue the finger board to the neck and bore the holes for the keys. A regular completed finger board may be purchased, and then glued on to the neck.

If it is desirable to make the finger board, glue the pieces of rosewood or ebony on the neck. Then with the aid of a knife, bevel, and rule, measure off and mark the lines for the frets. With a fine

Design for Mandolin

Scale Three Quarter Size.

by Chester Riley,
E. 18. 19.



tenon-saw cut the little slots to receive the fret wire. To assist in sawing accurately to the line, a little block of wood with one square face and edge may be clamped to the neck and the saw rested against the flat edge. The fret wire is held in place by ordinary liquid cement, such as is sold for cementing chinaware, crockery, hardwood, and the like. Now the neck should be glued in place. After the glue has hardened, sandpaper the completed object, rubbing with the grain.

The mandolin may be finished by giving the surface, with the exception of the top, a coat of natural color filler. After this has been rubbed off and dried, several coats of white shellac should be given. Allow the shellac to dry thoroly between coats, and rub down each coat with No. 0 steel wool. If five or six thin coats of shellac are given, a fine smooth finish may be had.

The keys, bridge, tail-piece, and strings may be purchased at any musical supply store.

MANUAL ARTS CONFERENCE AT UNIVERSITY OF MISSOURI.

CHARLES A. BENNETT.

THE annual Conference of men in the Mississippi Valley who are engaged in training teachers for manual arts and industrial education was held at the University of Missouri, Columbia, Missouri, on December 13, 14, and 15. The Conference was under the management of the United States Bureau of Education, and was presided over by Dr. William T. Bawden, specialist in industrial education. Representatives from fourteen states were present, representing the territory from Ohio to Utah and from Texas to Minnesota.

At the first session, after an introductory speech of welcome by President A. Ross Hill, of the University, Dr. J. H. Coursault, acting Dean of the College of Education, spoke to the theme, "Making Democracy Safe for the World." He gave the manual arts credit for introducing into the school curriculum the idea that all subject-matter ought to be practical. He pointed out, however, the possible danger in formulating too narrow a curriculum such as seems to be possible under the Smith-Hughes Law. He emphasized the fact that a too narrow curriculum will defeat itself. There is danger in lack of

vision in reference to political and educational affairs. There is danger of sacrificing insight to practical efficiency.

The conference program included the following main subjects:

- I. Practice teaching.
- II. The Smith-Hughes act.
- III. Examination and certification.
- IV. Course.

The first topic under I, was introduced by Professor Albert F. Siepert, of Bradley Institute, who spoke to the subject, "Preparation for Teaching Now Offered in the Institutions Represented in the Conference." This presentation was the result of an extended study of curricula in seventeen state universities, twelve private universities, eleven colleges, ten state agricultural colleges, three state teachers' colleges, six normal colleges, five state normal manual-training schools, sixty-four state normal schools, fifteen colored schools of normal or collegiate grades, seven private schools with normal departments, and eleven technical schools. He presented tables showing: (a) Types of curricula as to character and length of time required; (b) entrance requirements; (c) faculties as to number and de-

grees held; (d) faculties as to experience in trades and in teaching; (e) academic subjects taught; (f) professional subjects taught; (g) technical subjects taught. The conclusions reached were presented in the following theses:

1. In view of (1) the rapid growth of the teacher-training movement in the field of manual arts, and (2) the probable effect of the Smith-Hughes act, there is need of a study of the curricula of each institution with reference to (a) the type of teacher being prepared, (b) the subjects taught, (c) the time spent upon each, and (d) the sequence in which they are arranged.

2. Adequate time must be allowed in any given curriculum for the preparation of a teacher who will be competent to teach or do the line of work he is in charge of.

3. A clearer statement by the institution of aim to be attained by a student who is following any given program, is desirable.

4. The degree of specialization open to a prospective teacher should increase as the age of the pupils he will teach advances.

5. While each institution must be left free to work out its own problem, an agreement as to minimal essentials in the preparation of teachers for the various grades of school-work would be beneficial.

6. The lack of definite standards and readily administered tests is a serious matter, and should receive more consideration than is now given in various institutions.

7. Practice teaching and observation are essential factors in the preparation of every teacher, and more adequate attention must be given to these topics.

The second topic under the first subject was presented by Professor Fred C. Witcomb, of Miami University, Oxford, Ohio, who spoke on "Present Conditions in Respect to Practice Teaching." The third topic under the same subject was "A Proposed Program for Practice Teaching." This was presented by Hans Schmidt, of the Oshkosh State Normal School. Both the second and the third topics were based on the results of investigations by the questionnaire method.

After considerable discussion it was decided that this whole subject of practice teaching be continued for consideration another year.

The discussion of the second main subject, The Smith-Hughes act, was opened by Robert J. Leonard, district agent of the Federal Board for Vocational Education. He first stated that he was not present in an official capacity, and therefore whatever he might say should be regarded as his opinion and not as an expression of the policies of the Federal Board. He then proceeded to give a remarkably illuminating address on the possibilities of work under the Smith-Hughes law, especially as they concern the training of teachers. He presented his subject under three heads: (1) The legal status; (2) kinds of schools; (3) suggested methods and plans that may be adopted under the Smith-Hughes act.

In the discussion, which was very spontaneous and freely indulged in throughout the session, there were a few points around which interest especially centered. One of these was the suggestion that has come from members of the Federal Board that five years of practical trade experience would be expected of men teaching unit trade courses in shopwork under the Smith-Hughes law. Mr. Leonard pointed out that the "five years" is not in the law, and that the effort of the Federal Board will be to insure "adequate training." It was understood from this that the term "five years" was intended to express a general idea rather than a fixed time, and that the Federal Board is likely to recognize that some men are better mechanics after three years of experience than others are after twenty. But Federal funds can be used in support of industrial-teacher training only when the students are trained workers or are taking a course to become such. The Smith-

Hughes teachers must have two vocations—the trade, and teaching. However, the initiative for establishing the standards for such “adequate training” rests with the state boards instead of with the Federal Board, but the state boards must establish standards that meet the approval of the Federal Board. Whether the Federal Board will have a uniform standard for all the states was not brought out in the discussion. There may be good reasons for different standards. Having such may relieve some of the difficulties in administering the law. Concerning standards it was further stated that there should be a sliding scale of requirements for teachers, beginning with what is reasonably possible at present, and increasing to a satisfactory standard; but the basis for certification should always be performance rather than passing a written examination. The sliding-scale plan can be accomplished by having three kinds of certificates—provisional, limited, and permanent.

Another center of interest in the discussion was the general industrial school for cities of 25,000 population or less, which will come under the provisions of the Smith-Hughes law. The fact that the kind of teachers needed for giving instruction in shopwork in such schools will not be far different from the best that have been trained by several of the schools now preparing teachers of the manual arts, was especially noted. The general industrial schools will devote one-half of the school time to industry and one-half to related and academic subjects. For such school three types of teachers will be needed: (a) Teachers of shopwork who may give instruction in several trades; (b) teachers of related subjects; (c) teachers of modernized academic subjects. In some cases one teacher is likely to cover (a) and (b) or (b) and (c). Several present courses in state colleges, universities, state

normal schools, special normal and technical schools, with but slight modification, will meet the needs for all three of these types of teachers. Some of these courses covering four years of work beyond the high school and requiring 50 per cent or more time spent in shopwork and drawing, are now available.

Under the fourth general subject of the program George F. Buxton, of Stout Institute, spoke on the topic: “Content of Technical Courses in Intermediate or Junior High-Schools.” Mr. Buxton recommended that the shopwork of a junior high-school include courses in twenty-four different trades or occupations. Each of these twenty-four courses should be followed five double periods a week for nine weeks. Two courses should be carried on parallel. In this way the student would devote ten double periods a week to industrial work, and cover eight courses during a year. In three years he would, therefore, cover twenty-four courses. Mr. Buxton stated that an experiment covering twelve courses of work in three years is being carried on at Stout Institute with great success, but he believed that the results would be more satisfactory if double the amount of time were to be devoted to the industrial work. Mr. Buxton suggested that one of the twenty-four courses might consist of a lecture-laboratory study of trades and occupations which could not be included in the twenty-three provided for in the school work. This twenty-fourth course would be essentially a final course, definitely planned with reference to vocational guidance. The discussion of Mr. Buxton’s proposition called forth some lively opposition from men who believe that more intensive training in a few typical trades is worth more to a boy than the beginnings of so many. The discussion was finally summarized as follows:

DIFFICULTIES WITH MR. BUXTON'S PROPOSITION.

- (1) Danger of lowering standards of workmanship.
- (2) All work given in the twenty-four courses would belong to the beginning stage of each trade.
- (3) Too little time to form good habits of tool handling in one trade before the next is taken up.
- (4) There would be many difficulties in securing satisfactory teachers.

ADVANTAGES OF MR. BUXTON'S PROPOSITION.

- (1) An exceptional opportunity for vocational acquaintance courses.
- (2) As much time given to each trade as is now given to manual-training classes in a school year when they get only an hour and a quarter a week.
- (3) Gives a broad cultural basis for appreciation of industrial work.
- (4) Appeals to the interest of the boys of junior high school age.

The two points of view brought out in the discussion of this topic recalled the development that has taken place in science instruction during the past thirty years. In the early period of science teaching emphasis was placed upon facts. The teacher felt it his special duty to give the student a great number of interesting "scientific facts." In the second stage the emphasis shifted from facts to methods.

It then became the special effort of the teacher to give the student the "scientific method" of securing and using facts. Some teachers went so far as to say that they did not care anything about the facts, provided the student got the method. Present-day teachers of science have looked upon both these points of view as extreme. No teacher is willing to consider his work fully satisfactory unless he has given the student both the facts and the methods of science in a reasonable balance.

It was then pointed out that the scheme presented by Mr. Buxton may be compared to the extreme view which emphasized facts, whereas the opposite point of view, which would emphasize methods and technique in one trade only, would be compared to emphasis on methods merely. By analogy, future experience is likely to show that the best results will come from a proper balance of the two.

From the beginning to the end, the conference was stimulating and profitable to every man present.

The place of meeting decided on for next year was the Indiana State Normal School, Terre Haute, Indiana. The invitation was extended by Professor M. L. Laubach.

Instead of trying to split schools into two kinds, one of a trade type for children who it is assumed are to be employees and one of a liberal type for the children of the well-to-do, it will aim at such a reorganization of existing schools as will give all pupils a genuine respect for useful work, ability to render service and contempt for social parasites whether they be called tramps or leaders of "society."

—JOHN DEWEY.

EDITORIAL REVIEW OF THE MONTH

AS THE American people start out on the new year they are conscious of great things immediately ahead of them—great tasks, great problems, great opportunities for service. Never before in the history of the nation have things to do loomed up so large. Soldiers and more soldiers, ships and more ships, wheat and more wheat; and these all mean more skill, more training, and more perfect co-operation. What has been accomplished during the past ten months should send a thrill thru every American; but what is ahead should thrill him more. To be a factor—even a small one—in the history that is to be written in the year 1918 is an American's great opportunity. And the encouraging thing about it all is that in the team work which is absolutely essential, everybody can have a part, including the teacher of manual arts. It would be possible to enumerate many things that may be done by manual arts teachers who are not eligible for honors in France. We mention two.

First, there is the Liberty Loan. Word has come from the Liberty Loan Executive Committee that early in 1918, probably about the middle of February, the government will call upon the people of the United States to subscribe for the third Liberty Loan. The Government's requirements for feeding, training, equipping, and transporting an army of a million men are stupendous, and if it should be two millions, so much the greater. Most of this money must be raised thru the sale of Liberty Bonds. The war must be financed largely thru the savings of the people. If subscriptions are prompt and large enough the Government will be relieved of worry in that direction. The manual arts teacher can help educate the

people to see the need of subscribing and to the superior investment value of Government bonds.

Second, it seems to be the special work of the manual arts teacher to increase the skill of the nation at this time. While some have been called to train men for specific jobs in ship-building and other industries, every teacher may feel a special responsibility for the skill and thoroughness of the boys who come under his instruction, realizing that only by increasing the skill of the individual can the skill of the nation be increased. To produce one more efficient worker, or two more, or ten more, would be a service to the nation at this time; or to start ten or twenty or a hundred on the road to industrial efficiency, is a public service. Every manual arts teacher is surely going to have an opportunity to serve his country in the year of 1918.

THE PROTECTION AND TRAINING OF CHILDREN A NECESSARY WAR MEASURE.

THAT there is need for extra protection for the potential working child at the present time is shown in many ways. Recent figures from a large Eastern city show that there has been a decrease in the elementary school enrollment of over three thousand children within a year. The superintendent states that it is due to the unprecedented demand for child labor, and that the demand is still increasing.

The enforcement of present child labor laws and compulsory school attendance laws will prevent such a demoralization of the school system as that which occurred in Great Britain, and it is safe to say that the children under sixteen will

be well protected in most of the progressive states. But even in these states, and under the most favorable conditions, there is need of protecting those children who leave school unnecessarily to accept low-grade positions in shop and factory simply because the unusually high wage is so alluring.

Boys who, under conditions obtaining three years ago, could not find places where they could earn more than six dollars a week, now find it possible, in many communities, to get work at from two to three dollars a day.

Two dollars and seventy-five cents a day is a high hurdle to put in front of a school door. It raises the question in the minds of the parents, as well as the children, as to whether that which the child receives in the school is actually worth as much. Of course, in general, we believe that it is; but we are not in a good position to show the reason for the faith that is in us. The duty of the school, and of the community, too, should be obvious.

First, We should study the situation sufficiently to enable us to prove to the potential working children just what another year or two of education would be worth—and to show them the reason why.

Second, We should give added emphasis to the most practical and effective industrial training in the schools, to the end that young people will not only stay in school a little longer, but that such extension of school life will increase their efficiency and their earning power, thus enabling them to give added service to their country later on as the result of added education now.

Third, We should make the greatest possible effort at this time to provide for all children who go to work, in spite of our efforts to hold them, some measure of educational supervision, thru the establishment of part-time classes, day and evening continuation schools, and public schools in employers' plants.

The great danger is not so much that children will begin work, as it is that they will cease permanently to follow any kind

of systematic education. Our problem at this time is not so much to protect children under fourteen from exploitation and from dangerous employments, as it is to protect the potential working children from fourteen to eighteen from selling their birthright, and that unnecessarily, for a mess of pottage.

PROFESSOR LEAVITT GOES TO PITTSBURG.

ONE of the most important announcements of the year 1917 in the industrial education field comes just at its close. Professor Frank M. Leavitt, of the University of Chicago, has become assistant superintendent of schools in Pittsburg, Pa., where he will be in charge of industrial training in the public schools. Last month we announced that he had been granted a leave of absence from the university to assist the National Industrial Conference Board, in Boston, for four months. Professor Leavitt had been in Boston only a few days when he was induced to cancel his engagement with the Conference Board and accept the position in Pittsburg. Thru this appointment the city of Pittsburg is securing one of the leading specialists in the nation, and Mr. Leavitt is going back to the same type of position he held for seventeen years in the city of Boston. But this is not all. It is announced that Mr. Leavitt will devote one-fifth of his time to Carnegie Institute of Technology. Just what courses he will give at Carnegie has not yet been announced. In this combination position there are great possibilities.

JUNIOR HIGH SCHOOLS IN MINNESOTA.

A STUDY of the manual arts instruction in the junior high schools of Minnesota has been made by Roy E. Spriggs, of Rochester, Minn.,

whose purpose was to find out the present status of industrial work in the twenty-five junior high schools in the state, and learn certain facts concerning the character of the instruction given. Mr. Spriggs sent out a questionnaire to each of the twenty-five schools, and received nineteen replies. A summary of his findings may be found in the November number of the *Manual Arts Bulletin*, published by the Manual Arts Club of Minneapolis.

Among the facts stated in his summary Mr. Spriggs gives the following: 90 per cent of the schools offer benchwork in wood in the seventh grade; 95 per cent give woodwork in some form in the eighth grade; and 90 per cent offer some form of woodwork and mechanical drawing in the ninth grade. These figures seem very good until you discover that only four schools give more than 80 minutes a week to this work, and at least one of them gives only 60 minutes. Seventy per cent of the schools make manual training compulsory in the seventh grade, and 75 per cent in the eighth grade; but there is little value in making shopwork compulsory until it is made effective. Instead of 80 minutes a week the manual arts work ought to have 80 minutes a day in a junior high school. Why change the name of a school if you do not change the scheme of study? One of the fundamental purposes of a junior high school is to give a boy a better opportunity to select the occupation best suited to him. To accomplish this the curriculum must be more industrial—more prevocational in character. Only three of the nineteen schools allow 40 minutes a day for manual training, and only one allows 60 minutes.

From such figures as these it is clear that the group of problems centering around vocational guidance, prevocational

training, and manual training, in the grammar grades, are not necessarily solved by adopting the new organization known as the junior high school. There is still much work to be done in convincing school administrators and school boards that the manual arts are worthy of a place equal to that of any subject in the curriculum, and that desired results can not be obtained in this branch of instruction until an adequate apportionment of time has been given to the work.

We may waste a great deal of time discussing whether many types of handwork or a few should be included in the junior high school program, when the fact is that a large percentage of the junior high schools have not yet provided a reasonable time in which to do one line of work effectively. While discussing many questions which are still merely academic, let us not forget the essential practical question of more time for manual arts work in a junior high school. Under no other conditions can the work be done effectively.

THE GREEN LAKE PLAN.

THE following account of a modified Gary plan of arranging a true schedule so as to give a reasonable amount of time for manual arts work has been received from our Northwestern representative, Edward G. Anderson, of Seattle:

Teachers of handwork in cities where the school authorities refuse to devote more than an hour or two each week to shop activities for fear academic subjects will suffer as a consequence, should request their superiors to examine the program worked out by J. M. Kniseley, principal of the Green Lake school, Seattle. This program permits each pupil to have a period of 80 minutes in the shop or cooking laboratory daily, and also places more than ordinary emphasis on the regular academic work.

The Green Lake plan divides the subjects taught into two general classes: (1) Academic

subjects, including history, geography, arithmetic, language and reading; (2) special subjects, including writing, spelling, music, drawing, manual training, domestic science, primary handwork and play. Forty-eight pupils are assigned to each academic classroom. These are divided into two groups of equal number. One group remains in the classroom while the other is taking some special subject. Thus no academic teacher has more than 24 in her care at one time.

This plan secures the benefits of the departmental system without its disadvantages, as it preserves the function of teacher in "locus parentis"; the academic teacher has to plan but four studies a day instead of eight or ten as formerly; it makes possible effective supervised study; it permits the pupils to be promoted by subjects instead of by years; it provides better physical conditions for study and recitation, as but one division is in a room at a time; it eliminates home study; and it secures the benefits of specially-trained teachers for the special subjects without increasing the teaching force.

What we as shop men are especially interested in is the fact that the plan makes it possible to devote an adequate amount of time to the manual arts. Below the sixth grade each pupil devotes three forty-minute periods each week to handwork in various materials, and the higher grades have eighty minutes daily, enabling the teacher to "get somewhere" in his work.

Perhaps it will be hard to convince the average superintendent that it is possible to devote this amount of time to manual activities without a reaction in the quality of the academic work, but after two years' trial the Green Lake plan has demonstrated without a question of doubt that this is possible. During the eight years that Mr. Kniseley was principal, before the plan was in operation, he reports that the rate of promotion was never up to 100 per cent; but in the last two years it has never fallen below that mark, and some semesters it has been much above 100 per cent, because of double promotions. The school is well above the average in all city tests and in many of the educational-survey tests given in other cities originally but used at Green Lake to measure the standard of attainment. The standard of promotion has not been lowered to permit the better showing, as the above statements prove.

"GARYIZED" SCHOOLS IN NEWARK.

IN reply to an inquiry we have received the following encouraging account of the new organization of the manual arts work in Newark, N. J. It was written by Hugo B. Froelich, director of the Department of Manual Arts in the public schools. We are glad to present this statement to our readers just as it came to us:

The Gary plan has not been adopted bodily in Newark, but the essential features have been adapted to suit Newark's needs. Neither is the entire school system "Garyized." There are but seven schools in the city now in operation on the Gary, or alternating plan, but the successful operation of these seven leaves little doubt as to the extension of the plan to include the entire school system of the city.

Under the alternating plan, as we operate it, the working capacity of an ordinary school is increased about 45 per cent. For instance, under the old plan, a building may have had sixty rooms, and therefore was able to care for sixty classes, providing every child with a seat and desk. But there were periods when the seat and desk were unoccupied for the children were on the playground, in the manual training shops, in the cooking laboratory, in the science rooms, in the gymnasium, in the art studios, etc. Under this alternating plan, as carried out in Newark, we increase the number of "academic" classes 45 per cent and still have room assignments for the "occupations," such as printing, woodworking, electricity, sewing, cooking, science, art, gymnasium, and auditorium interests. We operate two schools, designated as the X school and the Y school, in the academic courses.

Under the old plan, our school buildings could not keep pace with the increase in attendance. Nearly every school in the city was obliged to resort to "part time" classes. Under the alternating plan, every child gets a full school day. Under the old plan, school began at 9 a. m. and closed at 3 p. m. Under the alternating plan, school begins at 8:30 a. m. and closes at 3:45 p. m. This gives the manual arts a longer day and consequently a greater opportunity. The pupils receive their full quota of training in academic subjects, and an increased ratio for shopwork, sewing, cooking, etc. Under the old plan, 60 or at

the most 90 minutes per week were allotted for manual arts. The alternating plan provides for 80 and 85 minutes *per day, five days in the week and ten weeks in the term*, for such subjects as are included under the head of the manual arts. This intensive teaching results in marvelous growth along all industrial lines. The pupils feel that the results obtained are well worth while, and so the manual arts have become most popular and have taken their rightful place as major subjects, along with the three R's! Certainly in actual life cooking and sewing are as essential as arithmetic and geography, and as certainly they are more often used. And in printing, electricity, and other phases of manual training, the habit of thinking out and carrying to a conclusion any problem that is undertaken, is of more value than the knowledge of square root or of technical grammar.

Another important feature of the alternating school is the fact that above the fourth grade these subjects are taught by special teachers, in rooms or shops designed for the different functions of the manual arts. The advantage of working under these conditions is too obvious to need comment. Under the old system a pupil usually was trained in but one activity. Under the alternating plan, our boys receive in one year, ten weeks of manual training (woodwork), ten weeks of printing, ten weeks of art, and ten weeks of electricity. This increased number of activities gives every boy a wide range of experiences. The girls have equal opportunities in cooking, sewing, homemaking, art, etc.

Never since the time of Pestalozzi and Froebel has there been such real educational advancement in our schools. Because of the greater opportunities afforded by conditions in the alternating schools, the manual arts are being established on an equal footing with the so-called academic subjects.

OLD FACTS IN NEW FORM.

THE school survey in Columbus, Ohio, has brought to public attention some very old facts concerning manual training in that city which, if the real significance were to be appreciated by the citizens, would bring about vital changes in the school program. The com-

mittee investigating the manual training found the work going on in 26 centers with from 300 to 425 pupils in a center. They found that only from one to one and a half hours of school time each week were devoted to the work. They said that this amount is not sufficient training for boys who will later have to compete in this mechanical age. The committee might well have added that twice that amount of time would bring more than twice the results in training value.

Columbus is by no means the only city that needs to economize by giving more manual training to each pupil who takes shopwork, even if in doing so it becomes necessary to give the work to fewer pupils. Three hours a week to pupils in the seventh and eighth grades is worth more to the boys—is educationally more economical—than one and a half hours a week to pupils of the fifth, sixth, seventh and eighth grades. Give the fifth and sixth grade boys bookbinding or clay modeling or knot-tying or coping-saw work in the regular school room if nothing better is available, but don't fail to give the seventh and eighth grade boys three hours a week in shop work.

Every school survey should emphasize such facts.

WHY BOYS QUIT SCHOOL AT FORT DODGE, IOWA.

THE supervisor of manual training at Fort Dodge, Iowa, Edward T. Snively, has made a partial survey of the public schools of that city with a view to discovering the chief reasons why so many boys leave the schools before completing the elementary school course. The results of this study have been published by the Engineering Extension Department of the Iowa State College of Agriculture and Mechanic Arts, Ames, Ia., in a bulletin entitled "The Boy and the School."

The conclusions are summarized by Mr. Snively as follows:

- (1) Fifty per cent of boys reaching grades 6 and 7 in Fort Dodge do not enter high school.
- (2) Most of them drop out because of lack of interest, not from financial necessity.
- (3) The boy's attitude and not the parent's is the determining factor in keeping him in school.
- (4) Boys who drop out of the grades average two years older than boys in the same grade who complete the high school course.
- (5) The boys who remain in school have a better chance of success in the business world (possibly due to native ability).
- (6) Boys who drop out of the grades are not prepared to decide upon or to perform any definite useful work and do not enter occupations in which there is opportunity for advancement.
- (7) Some means ought to be found to hold boys in schools longer and to give them definite preparation for useful work if they are to earn their living soon after leaving school.

Mr. Snively recommends (a) that the time devoted to manual training in the grades be extended to two hours a week, and that mechanical drawing be given as part of the course; (b) that from the 7th and 8th grades a special class be organized

for those students who are not likely to enter high school, and from one-third to one-half of their time to be devoted to prevocational work.

ILLINOIS HAS A VOCATIONAL EDUCATION BOARD.

ACTING under the amendment to the Smith-Hughes bill, which allows the governor of a state to appoint a state board of vocational education, Governor Lowden, of Illinois, has named the following persons as the State Vocational Education Board for Illinois:

Francis G. Blair, superintendent of Public Instruction.

Francis W. Shepherdson, director of the Department of Registration and Education.

Wm. H. Stead, director of the Department of Trade and Commerce.

Charles Adkins, director of the Department of Agriculture.

Barney Cohen, director of the Department of Labor.

It is probable that this newly appointed Board will soon formulate plans to be presented to the Federal Board for Vocational Education.

WASHINGTON CORRESPONDENCE.

FEDERAL BOARD FOR VOCATIONAL EDUCATION.

DURING the month of November a series of important conferences was held by members of the staff of the Federal Board with representatives of the Surgeon General's office, the U. S. Civil Service Commission, and the Department of Labor, for the discussion of plans for the reeducation of disabled soldiers and sailors. Conferences were also held with representatives of the United States Chamber of Commerce on various problems arising out of war emergency con-

ditions. The plans which are under way have not yet developed to the point of publication, but it is already evident that the activities of the Federal Board are to be an important factor in the nation's dealing with the problems arising out of the war.

SPECIAL TRAINING FOR DRAFTED MEN.

A comprehensive plan for the preliminary training of men of the second and subsequent drafts prior to their training at the army cantonments has been developed by the Federal Board in cooperation with

the War Department. This task was undertaken in order to supply a serious shortage of trained men in various lines needed in the army. Enrolment in the classes is limited to physically fit drafted men who volunteer for this purpose, thus avoiding the possibility of devoting time and energy to the training of men who may later be disqualified or exempted.

Steps were taken by the Federal Board early in November, in cooperation with State Boards for Vocational Education, to mobilize the resources of technical schools, concentrating attention first upon the specific problem of training radio and buzzer operators for the Signal Corps. Detailed outlines of a plan of procedure were sent to upwards of 600 schools in all parts of the country. The services of thousands of skilled newspaper telegraphers employed by one of the big press associations were offered to the government to assist in giving instruction.

Free tuition is provided, and it is reported that men who attain the required proficiency are practically certain of rapid promotion and increased pay. Federal funds under the Smith-Hughes Act will be available for use in payment of salaries of teachers for these emergency classes, subject to the requirements of the Act and the regulations of the Federal Board.

MORE STATE PLANS APPROVED.

Members of the staff have been active during the month in assisting state officials in drafting plans which will meet the standards and requirements of the Smith-Hughes Act. The plans of the following states were formally approved at the regular meeting of the Federal Board, held on November 16, and the amounts due from the Federal treasury for the first quarter ended October 1, 1917, were duly certified to the Secretary of the Treasury: Delaware, Georgia, Kentucky, Louisiana, Massachusetts, Nevada, New Jersey, New

Mexico, Oklahoma, South Carolina, Tennessee, Virginia, West Virginia, Wisconsin; total, 14 states. These states, added to the 8 states approved at the October meeting and reported in those columns last month, make a total of 22 states whose plans have thus far been approved.

It is expected that during the month of December the plans of 16 to 18 more states will be approved. January 1st is the latest date at which a state plan may be approved and certified for the first quarterly instalment of the fiscal year beginning July 1, 1917.

Four more states have availed themselves of the provision made by Congress, whereby the benefits of the Smith-Hughes Act may be accepted by the governor in case the legislature did not meet in 1917 or adjourned without taking adverse action. These states are: Idaho, Illinois, Maryland, and Oregon. Only two states now remain which have not accepted the provisions of the Act: North Dakota and Rhode Island. The governor of Rhode Island has been in Europe and hence unable to act. It is expected that the legislature will take the matter up early in the next session which convenes in January, 1918.

NEW APPOINTMENTS.

The position of field agent for agricultural education for District No. 1, with headquarters at New York City, has been filled by the appointment of Raymond W. Heim, formerly agent for agricultural education in the state department of public instruction, Harrisburg, Pa. Dr. Cheesman A. Herrick, president, Girard College, Philadelphia has been appointed special agent for commercial education.

The following additional appointments in connection with war emergency work have been announced: Prof. Kenneth G. Smith, extension division, State College of Agriculture, Ames, Iowa, temporary

special agent; H. W. Geromanos, special agent for occupational training of drafted men; Mrs. Anna L. Burdick, Des Moines, Iowa, special agent for women's trades.

The board of trustees of Dunwoody Institute, Minneapolis, has granted Dr. Prosser an additional six months leave of absence, which will make it possible for him to serve as director for the Federal Board for one full year. During the past few weeks, Lewis H. Carris, assistant director for industrial education, has been making an extended trip thru the west and middle west, for the purpose of becoming acquainted with conditions and assisting state officials in the preparation of their plans. The following states were visited: Indiana, Kansas, Texas, South Dakota, North Dakota, Wyoming, Montana, Minnesota.

FIRST ANNUAL REPORT OF THE FEDERAL BOARD.

During the month of December the Federal Board published its first annual report, a brief but extremely interesting document, which will have historical as well as educational value. The Board has also published a bulletin of about 70 pages outlining the "Policies of the Federal Board for Vocational Education." Copies of these bulletins may be obtained upon application to the office of the Board, O'ray Building, 8th and G Streets, N. W., Washington, D. C.

UNITED STATES SHIPPING BOARD.

THE Industrial Training Section of Emergency Fleet Corporation, under the direction of E. E. MacNary, has made important progress during the past month.

With the approval of Admiral Bowles, manager of construction for the Emergency Fleet Corporation, the school for the training of instructors for the shipyards, referred to last month, has been established at the plant of the Newport News Shipbuilding and Drydock Company, Newport News, Va. The first consignment of skilled mechanics, selected from shipyards in all parts of the country, has been assembled here, and the school is now in successful operation.

The director in charge of the Instructor Training Center is Charles R. Allen, agent of the State Board of Education, Boston, Mass. With him are associated, as an organizing staff, James E. Neary, formerly in charge of the apprentice school of the Fore River Shipbuilding Corporation, and H. C. Waugh, instructor in industrial education, public school department, Seattle, Wash.

The instructional staff at present includes the following men: O. D. Evans, director of the Boston Continuation School; E. M. Longfield, department head, Boston Trade School for Boys; James P. Casey, local director, Central Massachusetts District for Training Vocational Teachers; James E. Dougan, director, Boys' Vocational School, Newark, N. J.; George A. Burrige, local director, Connecticut Valley District (Mass.) for Training Vocational Teachers; H. L. Jones, Director of industrial education, Somerville, Mass.; James McKinney, instructor in industrial education, Ethical Culture School, New York City; C. E. Parsill, director of industrial education, Middlesex County, New Jersey; Francis H. Wing, director of vocational education, Buffalo, N. Y.

OPEN QUESTIONS

MANY KINDS OF WORK, OR FEW?

Mr. Editor:

The December Open Questions department has an article under this heading which presents well arguments for many kinds of work. Lest some beginner conclude from such worthy argument that there is nothing to be said on the other side, the following is offered:

First, let it be granted that the present movement toward a more diversified offering is a worthy one. The investigations by men like Prof. Thorndike, and the plea for attention to individual needs, are timely. The old idea that pupils should be required to take a limited number of subjects and pursue these extendedly without regard to subject-matter, for the sake of discipline, has had certain serious limitations. However, the charge is being made that our present plan of giving pupils a little of this and a little of that, and not much of any one thing, has made of them putterers or potterers. For years, Dr. Judd, of Chicago University, has been urging upon manual training men the necessity of so arranging their work that it may be progressive. We have had beginnings of joinery the first year, beginnings of pattern-making, beginnings of turning, beginnings of forging, beginnings of machine shop, beginnings of carpentry—always beginnings. The fact that that one comes in the first year and others later does not indicate progress in any one line. Deans of schools of engineering state that they would much prefer that the manual training high school confine itself, in so far as boys are being prepared for engineering schools, to teaching well one or two subjects in shopwork rather than trying to cover an extended field. A contractor of Chicago refused to allow his second son to follow his first son thru a four-year technical manual arts course because he claimed that such work made potterers out of boys. The change in some of our grammar grade manual training of today, wherein our "good old course in woodwork and mechanical drawing" has given way to a little woodwork, a little cement work, a little metal work of one kind or another, under the name of prevocational work, is open to question as to merit.

The facts are that this spreading out in

order to place the pupil in touch with extended subject-matter has made for certain habits of mind and body that class as superficial, slovenly, shallow; for inability to concentrate upon a task and "see it thru." The mental stream is, as it were, of a given volume; spread it out and you have shallowness; deepen it unduly and you get depth with narrowness. It is a wise teacher who knows the bounds. It is quite likely that a single course in woodwork and mechanical drawing, or any other subject which lends itself to progressive instruction and experience, is as good for a boy as a lot of beginnings in a large number of different interests. It is possible that the value of habits so formed will more than offset the lack of superficial contact with a variety of trades subject-matter. A boy who has developed ideals of accuracy, etc., may be as valuable to an employer in a different line as is the boy who has had a smattering of a lot of trades including the trade into which he goes and who has never formed such habits.

If there are weaknesses in the old notion of discipline, there are also weaknesses in the idea of unlimited values thru contact with varieties of subject-matter for short intervals only.

As to one teacher's caring for 24 or 25 boys, or even 15 or 20, when allowed to enter the shop at any time, the writer would beg to be excused. Why should such a condition confront a teacher of shopwork? Or, confronting him, why should he have to make such adjustments any more than any other teacher? If the condition exists because these boys are working along fifteen or twenty different kinds of trades, that teacher is certainly not teaching well those lines. He could not be, even with summer school instruction in each. Far better would it be to take a few lines of work and become somewhat proficient in them, and thereby be able to have the boys acquire good habits. The habits so developed would be of more value than subject-matter contact of so slight and superficial a nature.

Inquirer about many or few kinds of work will do well not to be stampeded into many kinds of work thru recent attempts to emphasize subject-matter values as contrasted with methods or discipline values.

—I. S. G.

HOW MANY PERIODS A DAY?

Mr. Editor:

Manual-training teachers usually have two periods for each of their classes—double periods in other words. In my individual case I meet four classes each day, teaching eight forty-minute periods. Personally I do not particularly object, as I feel that is evidence of the popularity of the manual training department. Out of 270 boys in our school I have 92 in my department. The point I want to make, however, is this: The North Central Association of Secondary Schools requires for the schools they recognize that no teacher be employed more than *six* periods a day; but at the same time they claim that a teacher of manual training who uses double periods, is entitled to count only his two periods as one—and a fourth to one and a half periods. In other words, a teacher of manual training might be required to teach *nine* or even *ten* periods a day, where a teacher of, say history, would not be permitted to teach more than six.

I claim that a teacher of manual training who does his full duty, gets just as much mental strain as does a teacher of any other subject, and I *know* he has to be alert to a greater number of things coming up that require an instant and correct decision. This is especially true where the shop is well equipped with machines.

I would be glad to know your ideas on the above, and whether the subject has ever been up for discussion before.

—GEO. T. BOYCE.

THE COMMON STARTING POINT.

My dear Mr. Editor:

Chapter IX of "Handwork in Wood," by Professor Noyes, entitled "Principles of Joinery" strikes me as one the most valuable in this very helpful book. It has always seemed to me that there was a splendid opportunity in the subject of woodworking to drill pupils in orderly and systematic work, and there is one principle in the chapter named above upon which I build my beginning work in manual training:

Avoid multiplication of errors by making all measurements (as far as possible) from a com-

mon starting point, and laying off all angles from the same line or surface.

Judging by the work of some of the pupils who come to me from other schools in this city and others, it would seem that the working-face and joint-edge feature in dressing stock is not always considered a necessary matter or of sufficient importance to demand constant emphasis.

As a matter of fact it is in dressing stock that we have the fundamental application of the rule stated above. The usual pupil starting out to plane a board will follow the line of least resistance and plane the edges. With no definite aim in his planing, he forgets every dimension in a blind desire to see the shavings accumulate. Constantly reiterated emphasis on the value of a working face and edge, and proper marking to distinguish them from the other faces, is necessary to urge on his lagging interest, but once this good foundation is laid, he easily sees how these common starting-points aid him in obtaining correctly the dimensions of thickness and width. On stock where there are joints to be laid out I have the pupil square one end only to emphasize the method of laying out both tenon shoulders from the same starting point. Here in laying out the joints the great advantage of using this rule is plain, but perhaps the greatest triumph is evident in assembling, for these face surfaces aid materially here, and the pupil cannot fail to see it.

The other principles are important, doubtless, but to my mind this one is so fundamental and so far-reaching that the greatest good is to be gained by emphasizing it constantly in its various applications during the seventh and eighth grade work and the beginning high school woodworking course. The constant systematic procedure must result in a greater facility for the pupil in ordering his habits of mind and body. In addition, if this rule is learned in the grade classes, it makes the work of the advanced courses so much more effective.

—CHARLES W. CLARK,
Syracuse, New York.

Mr. Editor:

I would like to secure data regarding prices paid boys working on school projects after school hours.

—C. L.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.



"YELLOW BILL," TOY DUCK.

TOY DUCK.

THIS project presents some good problems in wood-turning, as the toy is practically made in the lathe by spindle and chuck turning. The different parts should be painted before being assembled. Any color scheme may be used, but the photograph shows a true "yellow-bill." Head, neck, and back are of blue-green, with a dash of gleaming silver. Wings and breast show orange and red, with fine lines of black. The under surface of the body is yellow, with white. The wheels are painted white in the lathe, with stripes of blue. The rim is orange, to match the wing.

AEROPLANES.

The two illustrations show projects of considerable interest to boys, and which involve very careful workmanship. The larger photograph was contributed by Edward A. Hilgen, of Cleveland, Ohio; the smaller by John G. Fair, of Findlay, Ohio.

PLAYGROUND SLIDES.

The photographs show a highly successful group problem within the ability of the average seventh and eighth grade boy. The floor is made of thin strips of wood which readily bend into shape, and permit of expansion and contraction so that rain does not affect them.

—JOHN G. FAIR.

Findlay, Ohio.

TOY DOG.

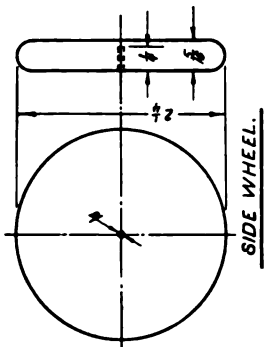
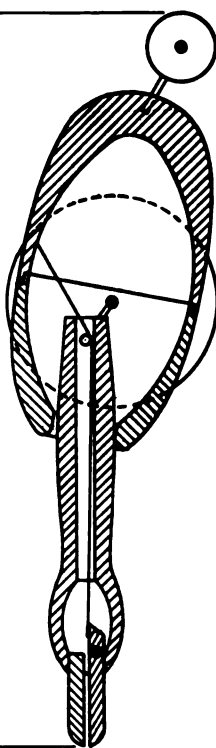
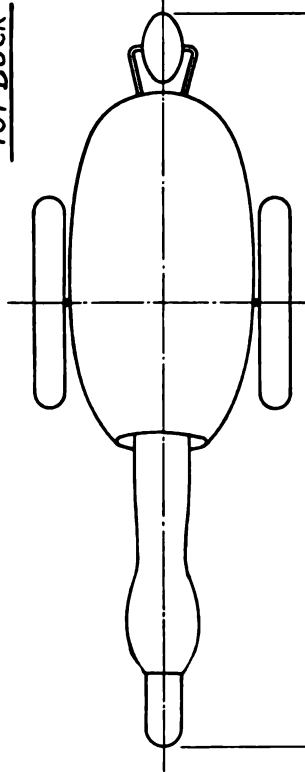
The toy dog for which patterns are shown in the accompanying drawing has been made with interest by the pupils in the sixth grade of the Boston schools. It is by far the most popular problem in the course for that year.

For the design credit is due Miss Helen E. Cleaves, assistant in manual arts.

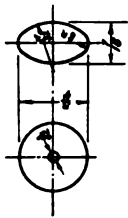


TOY AEROPLANE.

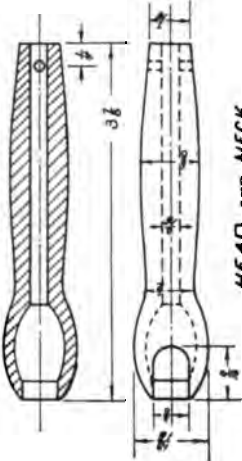
Toy Duck



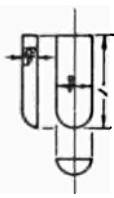
SIDE WHEEL.



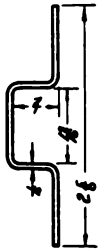
TRAILER.



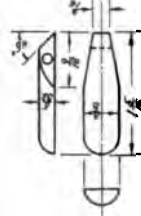
HEAD AND NECK.



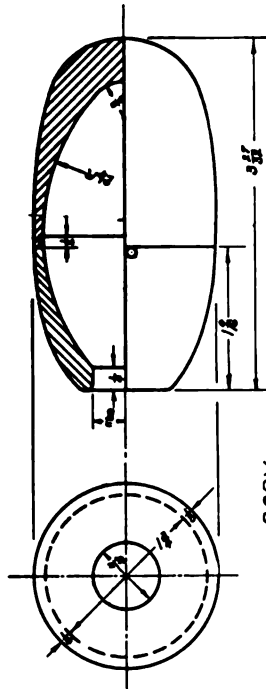
UPPER BILL.



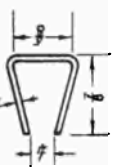
CRANK.



LOWER BILL.



BODY.



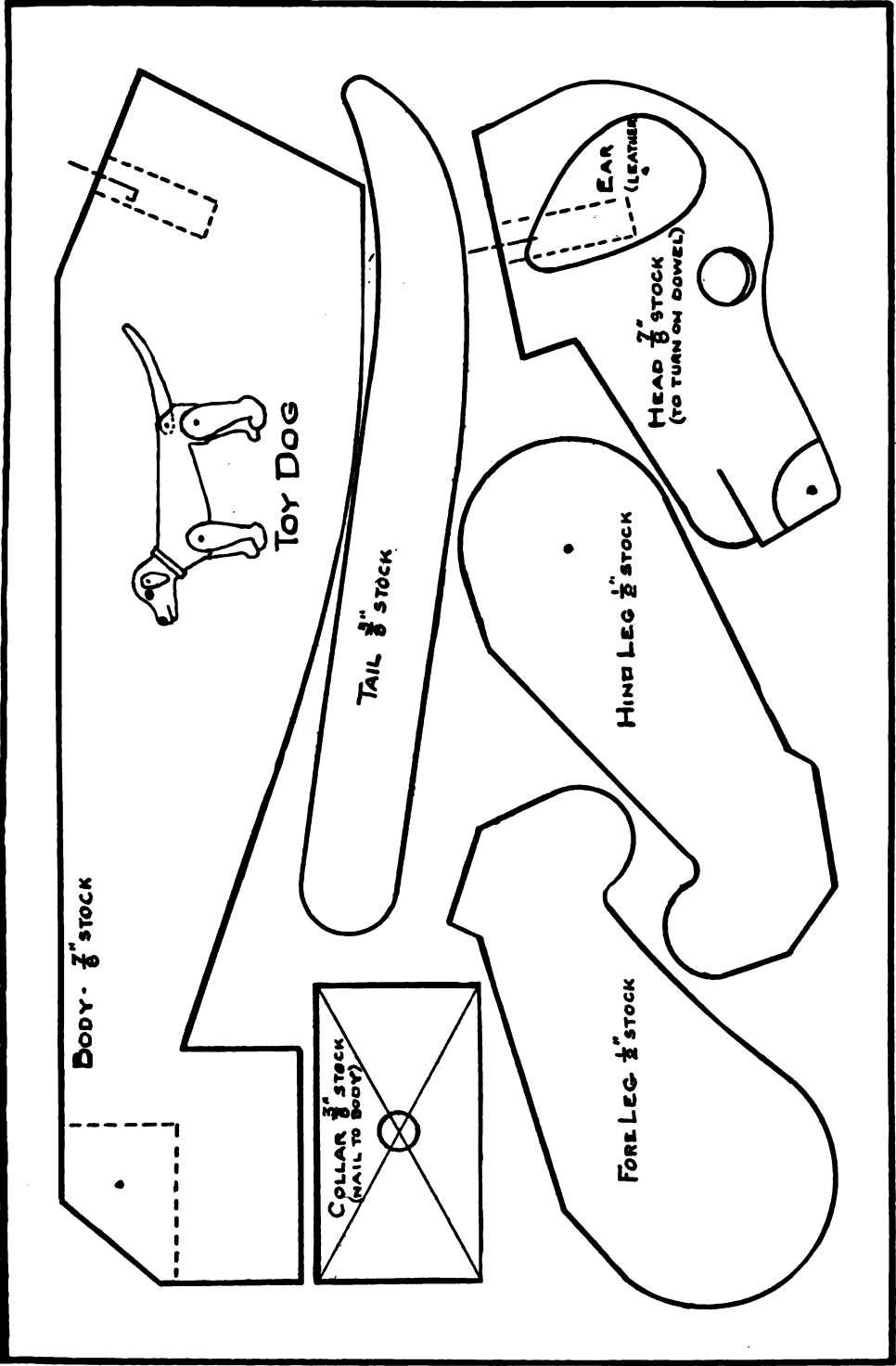
AXEL.



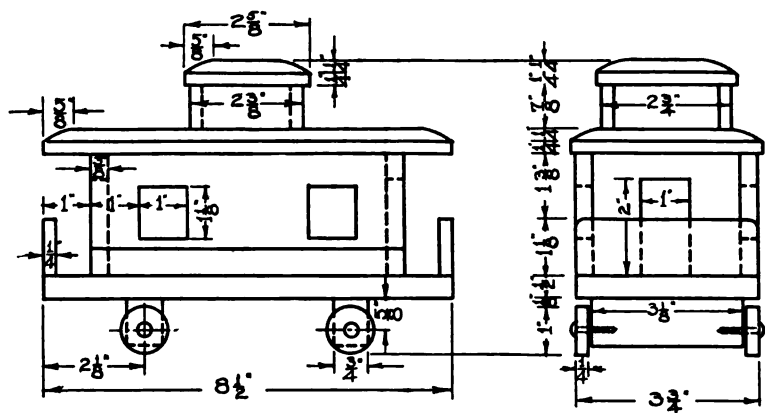
AEROPLANES MADE IN MR. HILGREN'S CLASSES, CLEVELAND, O.



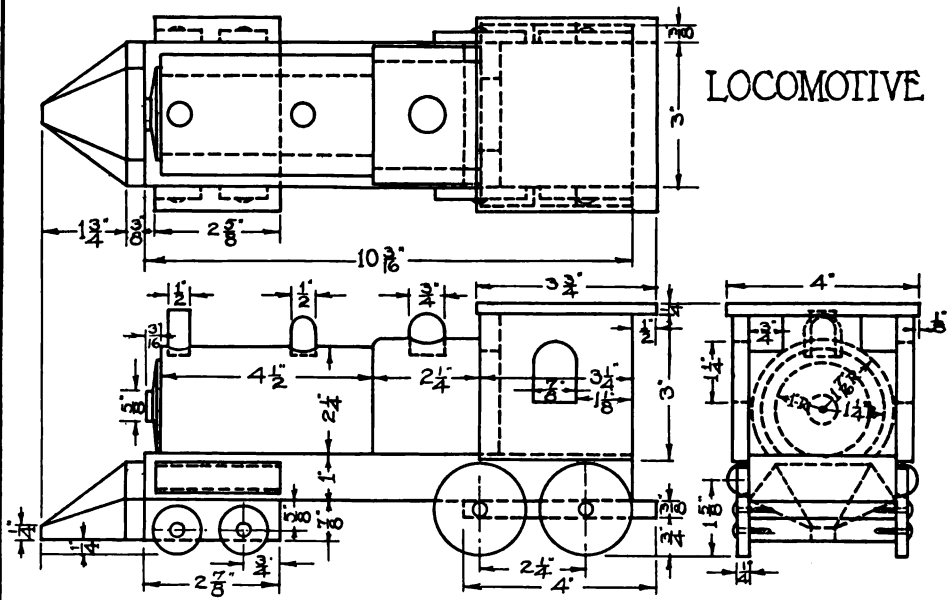
DO WE LIKE OUR SLIDE? FINDLAY, O.

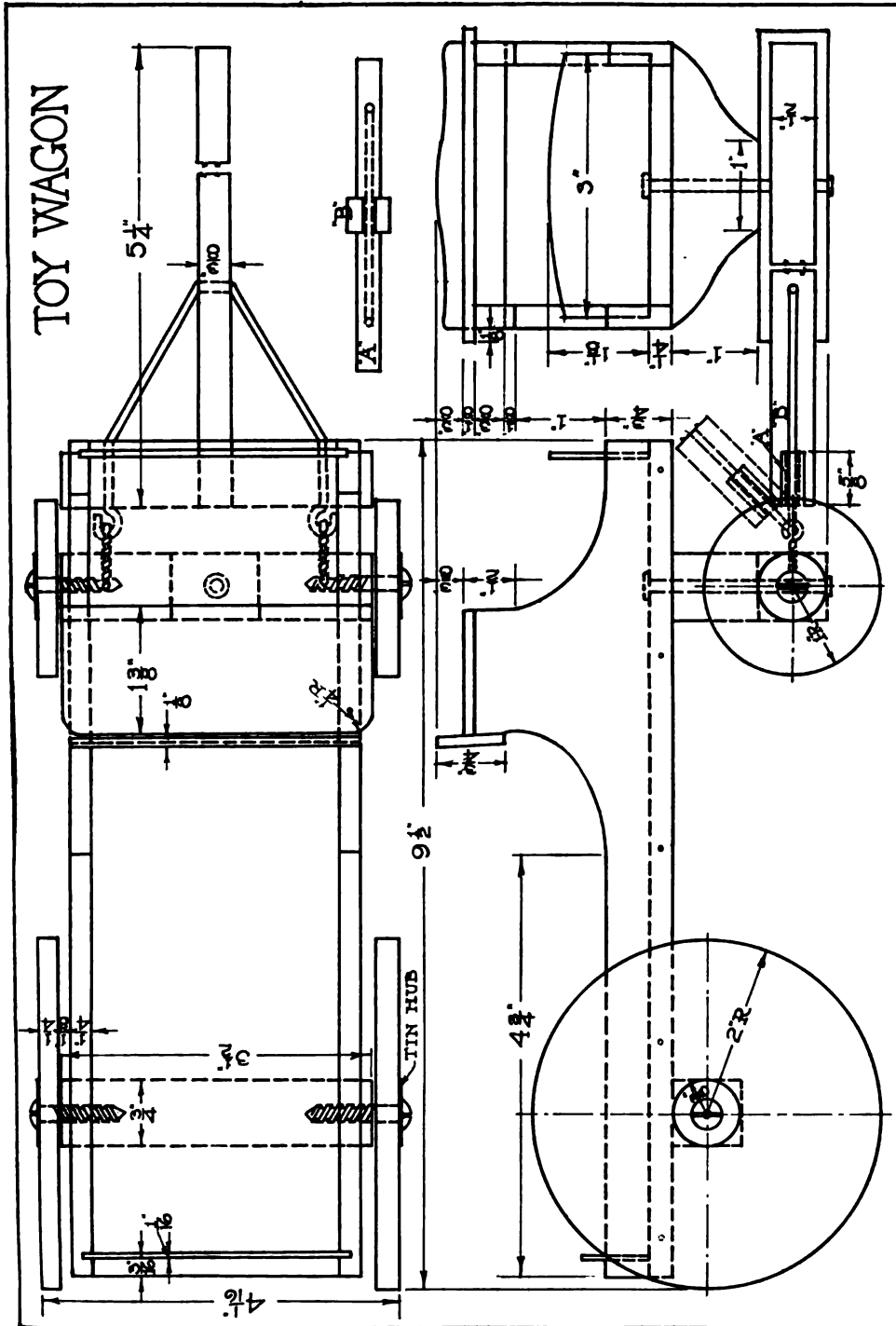


CABOOSE



LOCOMOTIVE







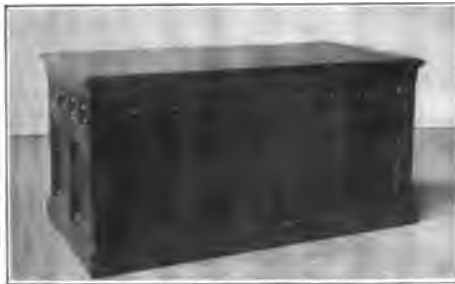
PLAY GROUND SLIDER, FINDLAY, O.

TOYS FROM SEATTLE, WASH.

The locomotive and caboose, toy wagon, and toy wheelbarrow are problems worked out very successfully under the direction of S. A. Olson, Seattle, Wash. The construction in each case is evident from the drawings. Wood is the chief material used, the metal fixtures are used wherever the project may be improved thereby. In all cases, the wise use of paint will make the finished article far more attractive to the boy or girl.

TABLE.

The photograph below shows a table made for the Social Hall at Bradley Institute. The project is intended for use by the presiding officers of various student organizations. It was designed in the classes in Furniture Design, and made in the Vocational Woodworking Shop. The table affords splendid opportunity for shopwork as well as the use of machinery in the construction of panels, etc.



CURRENT PUBLICATIONS

Wood and Other Organic Structural Materials, by Charles Henry Snow, dean of the School of Applied Science, New York University. McGraw-Hill Book Co., New York, 1917. 6 x 9 in.; 478+XVII pages, and 20 plates, with 90 illustrations in the text; price,

This is the book that many of our progressive teachers of woodworking have been looking for. It is a scientific but readable treatment of topics concerning which we often receive inquiries. For the teacher of woodworking who really wants to be master of his subject this is a valuable book for study and reference. The first two paragraphs of the author's preface state the purpose and scope of the book so well that we give them in full:

"The purpose of this book is to present general as well as physical characteristics of a group of structural materials, most of which are of organic origin. Among the materials thus described are woods, paints and varnishes—with their associated oils, pigments, gums, and resins—glues, creosotes, and india rubber. As stated, most of these materials are of organic origin. Those that are not, such as pigments and creosotes, have been added because of their close practical association with the others.

The book is designed for engineers, architects, students in schools of technology, teachers of manual training and others who use the materials described or who are interested in their properties."

The Little Pruning Book, by F. F. Rockwell. Published by Peck, Stow and Wilcox Co., Cleveland, 1917. Size, 5 x 7½ in.; 48 pages; price, 50 cents.

To one who has read only Government bulletins on pruning shrubs and trees this little book is a delightful surprise. "The gentle art of pruning" is introduced by parable and then the scientific facts of pruning are revealed in such simple, pleasing fashion that every backyard gardener can learn if he will but read. Some good sketches are used to illustrate the text.

Bugle Calls of Liberty, by Gertrude Van Duyn Southworth and Paul Mayo Paine. Published by Iroquois Publishing Co., Syracuse, New York, 1917; 5¼ x 7½ in.; 179 pages.

"This book gives some the great speeches

which have either inspired our fore-fathers or have inspired us to use the vast resources of our country for the causes of liberty, freedom, justice or World Democracy. It gives these speeches in order of their occurrence, and by way of introduction tells enough of the story of the times so that one may understand the full significance of each of these great masterpieces."

RECEIVED.

Fourth Annual Report of the Chief of the *Children's Bureau*, United States Department of Labor, Washington, D. C. This is the report for the year ending in June, 1916.

Manual Arts Bulletin. Published by the Manual Arts Club of Minneapolis and the Manual Arts Division of the Minnesota Educational Association. The September number contains an article on the "Technical and Industrial Courses for High Schools as Developed in Minneapolis" J. L. Pemberton, Central High School, Minneapolis.

Department-Store Education, by Helen Rich Norton, associate director, School of Salesmanship, Women's Educational and Industrial Union, Boston, Mass. Published by the Bureau of Education, Washington, D. C. This is an account of the training methods developed at the Boston School of Salesmanship, under the direction of Mrs. Lucinda W. Prince. For sale by the Women's Educational and Industrial Union, 264 Boylston Street, Boston, Mass. Price, 25 cents.

Night Schools and Night Classes in Trade and Industry, by Kenneth G. Smith. Bulletin 33 of the Engineering Extension Department of the Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa. Gives outlines of courses, methods of teaching, and management suggestions.

The Two Year Vocational Courses in Engineering. Bulletin 12, Engineering Extension Department, Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa.

Eastern Arts Association. Proceedings of the annual meeting held in Philadelphia, April, 1917.

MANUAL TRAINING MAGAZINE

FEBRUARY, 1918

SPEED.

ROBERT W. SELVIDGE.

Professor of Industrial Education, George Peabody College for Teachers, Nashville, Tennessee.

A FEW years ago while inspecting a house in the process of construction, my attention was attracted to the work of two lathers. The speed of the elder was above the average; the speed of the younger, his son, was little short of marvelous.

I observed them until lunch time. When they laid down their hatchets there was a striking change. The father washed his hands, got a cup of water and finished his lunch before the son was well started. For several days I observed them rather closely. The father was inclined to be quick and nervous in his general movements, the son was almost unthinkably slow in everything he did with the one exception of lathing. His hands moved like lightning as he drove the nails, cut a lath or put a lath in position. Apparently he could not drive a nail or use his hatchet slowly. In making a rack from a nail keg to hold his lathes, by nailing a half lath to the opposite sides of the keg, he exhibited the same speed. He would pick up a lath, place it against a studding, score it with his hatchet, break it over his knee and nail the pieces to the keg with the greatest speed.

After studying this situation for some days I spoke to the father about his son's speed. He said, "Yes, when Nelson wanted to learn the trade I told him that

this is no job for a snail, and that he couldn't make a living at it. He insisted on trying it, and I finally consented. I knew the only hope was in speeding him to the limit, and this I did from the very start. I hoped in this way to discourage him. He stuck and is still speeding. I can't keep up with him."

I happened to tell this story to a young man who had been captain of a university football team the year before. He said, "That's fine! I never heard of that theory before but it is exactly what Coach —— (naming a famous college coach) did to us last year. He kicked out a lot of the old men and put in new ones. We were never permitted to make any pretense of playing except at the very highest speed. When we ran signals it was at top speed, and at the first indication that we were slowing down he stopped us and made us walk our signals. We never learned how to play slowly, and he developed us into the fastest team the University ever had."

After thinking this over for a time I concluded that there might be an important educational principle involved, and decided to try it out. It occurred to me that we probably waste more time in teaching mechanical drawing than in teaching any other industrial subject. I therefore decided to try it out on mechanical drawing. I divided my class into

two sections. In section one I used the ordinary methods of instruction, emphasizing the desirability of speed, accuracy, etc., giving the usual instruction as to methods of procedure.

With section two I pursued an entirely different plan. I gave each student his drawing board, T-square, triangles and scale, and explained how they were to be used. I then explained the method of putting the sheet on the board. When each step in this was clearly understood, each student was instructed to fasten the sheet to the board as quickly as possible, and notify the instructor when he had finished by raising his hand. The instructor held a stop watch and gave the student his time which was entered on the sheet. Next came the layout of the sheet. A diagram was placed on the board and the lines numbered in the order in which they were to be drawn. When I was sure everything was clearly understood all was made ready and the word was given to start and finish with all possible speed. Each student's time was recorded. Following this, problems were assigned and students were required to make freehand sketches of them outside the class, and number the lines in the order in which they were to be drawn. When these were approved by the instructor we were ready for another speed contest. No one was permitted to touch his instruments until he knew exactly what he wanted to do and just how to do it. He could thus give his entire attention to speed.

The results at first were rather discouraging. The time required for getting ready appeared to be out of all proportion to the time required for doing the work. The quality of the work was better than I anticipated. At the end of eight weeks section two had made nearly twice as many plates as section one and the

quality of the work being done at that time was fully as good. At the end of twelve weeks section two had drawn more than twice as many plates, and the work was very much better than that of section one. The work of section one revealed the cramped and labored movements with which the work was done. The other showed the freedom, knowledge and decision with which it was done.

Of course these observations and experiments do not form a sufficient basis for any important conclusions, but they do suggest a line of investigation. If further experiments should point to the same conclusions, we would have some very valuable suggestions for the guidance of those instructing apprentices and students in trade and industrial schools.

It seems clear that habits which function frequently should be learned thru drill, and reduced to an automatic basis. The speed with which a piece of work is done is an essential part of the habit, and within very wide limits it is just as easy to develop the habit of performing the operation speedily as slowly. Experiments in the psychological laboratory show a very close correlation between speed and accuracy, and psychologists generally agree that "the more rapid workers are the more accurate." When work is done rapidly (not hurriedly), it gives a degree of satisfaction and feeling of mastery which is not attained when one does the work slowly and inefficiently. It is a false notion that one can learn to do a thing slowly and afterwards readily increase the rate of doing it. The easiest and most economical way is to execute the act as rapidly as possible from the start. This is contrary to the theory and practice of most teachers of industrial subjects but experiments in other lines seem to justify such conclusions.

THE EDUCATIONAL VALUE OF WOOD-CARVING

ELIZABETH FARROW.

Instructor in Wood-Carving, Winnipeg, Canada.

In the city of Winnipeg, Canada, wood-carving is being taught in the fifth, sixth and seventh grades. The boys come to the manual training center for half a day once a week. They employ approximately half of their time in construction and half in carving. As a rule the boys work under the same teacher for both the construction and the carving, but in one large, double center accommodating about fifty pupils there is a man in charge of the construction, while Miss Farrow, an Englishwoman educated at Kensington, teaches the carving. Most of the models constructed are also carved. When a boy's model is ready for carving he is transferred to Miss Farrow's class; when he has completed that part of the work he goes back to the other teacher to finish the construction. We are glad to print the following article which gives Miss Farrow's point of view. The illustrations show the character of the carving taught.—THE EDITORS.

BY NO means do I wish to pose as a student of history, but I have searched in vain for a people who have reached any height at all who have not carved in wood, marble or stone. In fact, this ability to make and decorate has heralded the dawn of every civilization that has arisen on the face of the earth, and at the highest stage of any people's development the nobility of the work of their hands has been one of the visible signs of their greatness and power. Think of the artist hunters who left traces of their work on the walls of caves many thousands of years ago; of the carvings of high artistic merit lately unearthed in ancient Assyria, the cradle of civilization; of those found in the peninsula of Yucatan. I need not speak of the glory of Greece and Rome. To this day it throws its spell over us. Nor do I need to speak of Medieval architecture with its wealth of decoration which some of us have seen, and before whose greatness we have humbled ourselves; and some of us know of beautiful furniture and household things belonging to a bygone age still in daily use.

Every age and every people until this last century or so, have used their hands for the production of things needed and the expression of their thoughts. As the

thoughts grew in power so the hand grew in skill. Is it any wonder, then, that crowded out of industry by the machine, crowded out of the life of the people, you should have this strong instinct to use the hands, appearing in our public schools? For after all this instinct seeking expression today is but the accumulated experience of past generations. All their thinking thru the hands, and all their moral feelings have contributed to its enrichment. A mere hundred years or so of progress along other lines is not going to take away an instinct so fundamental to life as this desire to decorate.

It is well known that to learn by doing is to learn with the full help of instinct. Most boys take pleasure in making things. Now, the more meaning the thing has for him that makes it, the greater does this pleasure tend to be. To take home a carved box means more to a boy than to take home a plain one, and the gain to him here lies as much in the attitude that is cultivated as in the dexterity which is acquired. He gains a sense of mastery over tools and materials. As his skill increases, he gains more confidence in overcoming difficulties. He will be more ready for life's demands.

Wood is an ideal material for teaching a boy manual work, and when you add

to construction well thought out and well planned decoration he is getting the fullest educational value out of the material and the few tools he uses. Carving puts into his hands tools he must *use*, and in the use of these, many things can be taught to him in a concrete way. He has the desire to cut and chip things anyway. Not to take advantage of this instinct, not to discipline, train and use it as a factor in the development of his character, would seem to me a neglect of a great opportunity.



FIG. 1. MATCHBOX HOLDER.

If it is true that the boy is living over again the race life, it is well to remember that carving preceded the use of color and the art of writing in the history of the race. Said an artist to me the other day, "I could do with your idea of woodcarving in the schools if you taught the boys the different cuts and then let them use their own designs." Instantly I answered, "But you do not expect your twelve-year-old daughter to improvise on the piano. You prefer she should pay strict attention to technique and then interpret the best masters she knows," and I was sadly tempted to labor the point and ask him whether he would like original cooking from a school girl just learning how to cook, and who at present knew little of flavors or food values. The boy and girl of twelve or so have nothing to say yet; a few years later they may have, but let them be content at first with learning thoroly the technic of any hand work, and then as men and women they may have something to say.

"For," says Robert Henri, "A man ceases to imitate when he has achieved the

power to fully and freely express his own ideas, and every man with imagination who has given the best of himself to work, who has learned to think and see clearly, can no more escape the possession of ideas



FIG. 2. TRAY.

than of ideals." So the criticism that the boy is not making his own designs need not bother us. The time is not ripe yet for self-expression in this art. When we have established a tradition for good craftsmanship, if the work should be carried into the high schools and thence to a manual arts department in the univer-



FIG. 3. SCISSORS HOLDER.

sity, you would not be able to escape self-expression, and in that case it will depend upon the character of the students and upon our national ideals whether that expression be beautiful and original, or whether it be decadent and degrading. But you will not escape decoration of some kind.

Now, if in childhood you can inculcate a love of sound craftsmanship and a desire for beauty in things of daily use you have

created a tremendous factor towards shaping the life of tomorrow. Educationalists are always confronted with this

and the best characteristics of a personality which are already in existence. In short, that education is only guidance.

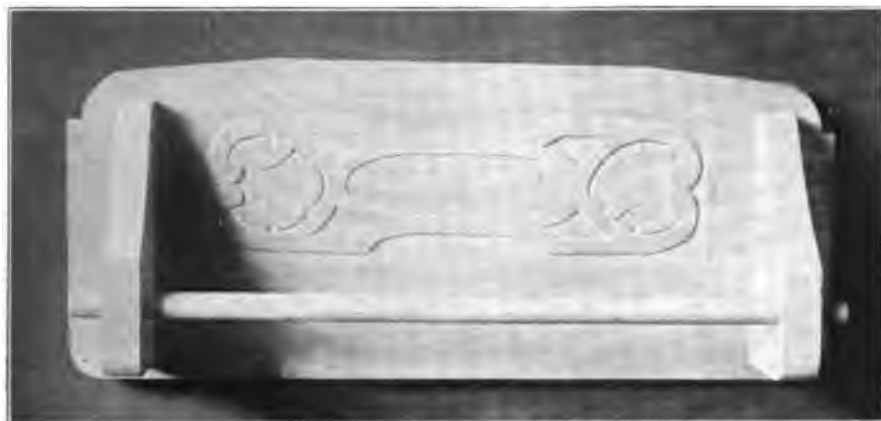


FIG. 4. TIE RACK.

practical problem, that community life is always changing and the life for which we would educate the men and women of tomorrow will not be the same as that of yesterday and today. This Canada of ours, which is now training and equipping an army greater than the combined forces of Wellington and Napoleon at the battle of Waterloo, is not only a nation in the making, but is taking its place in the family of nations, and as one of our statesmen says, "We shall not be allowed to put ourselves in the position of a minor after this war." The education a nation gives to its children is the truest reflection of itself. The question therefore becomes imperative. What do we wish to see in the life of the nation? Do we wish to realize Milton's ideal of a complete and generous education. "That which fits a man to perform justly, skilfully and magnanimously all the offices, both private and public, of peace and war." If so, how can we attain this ideal? There are people who hold that education cannot radically change character, that its only function is to develop the most useful talents

It is significant that we have in our public schools today handwork that helps to mould character, that calls for the qual-



FIG. 5. TEAPOT STAND.

ities of patience, perseverance, self reliance, that develops a fine relation between the brain and the hand that will develop any talent a boy may happen to possess in the way he loves best, by making something. This, it seems to me, is guidance of the very best kind.

Now the moment I want to say anything about even so humble a craft as wood-carving I am confronted with the problem of machinery. For both artists and craftsmen are in a thousand hard and bitter ways subject to the competition of machinery. If, at the dawn of this industrial era, there had been men with prophetic vision to whom the people would

continent to continent; good, when it helps to girdle the earth with rails of steel and brings mankind closer together; good, when it saws huge logs and saves human strength; but exceedingly bad wherever it attempts to do something better done by hand, whenever it destroys human fancy and imagination. In fact, there has been a misuse of machinery.



FIGS. 6 AND 7. WORK COMPLETED APRIL, 1917, BY BOYS 9 TO 13 YEARS OLD.

have listened, this need never have been. It is only now that we are realizing that it was not necessary for the old craft guilds to go. We see now they might have continued in some form protecting the standard of quality and keeping alive the continuous workshop traditions. Then machinery might have taken its proper place in this civilization as a servant of mankind, instead of a master. For if you stop to think you will find we have had no ethical interpretation of machinery. Sometimes it has been a good influence, sometimes an exceedingly bad one; good, when it has helped to build great ships, and played the part of galley slave in moving them from

We, living today, are not responsible for this and most of us regard it as inevitable. But is it? Is it going to be inevitable in the life of tomorrow? I am not familiar with the building trade here, but the building trade in England revealed a strange condition of affairs. Earthenware was made to look like stone; iron to look like wood; paper to look like tooled leather. Something was forever pretending to be something else, until the whole trade became corrupted thru and thru with tangible lies. Now this effort to produce something that shall look like something else is the result of a wrong development of machinery, and when there

are great and noble uses to which it can be put, it behooves us to be careful and watch what we allow machinery to do in this country, we who are not yet factory ridden and whose children do not work in mines and mills. If I read the signs of the times aright, the children we are educating will not put up with the shams, falsifications and bad workmanship we have put up with. There will be another interpretation of machinery. It will not be allowed to do anything that is better done by hand.

Industrially, machinery has taken from the worker almost entirely the proper use of his hands. Yet, now we have appearing in our public schools, little more than a century after the dawn of the industrial era, the rudiments of a craft that calls for the finest manipulation of the hands. Only those who have done this work know of the delicate twist of wrist and hand required to produce anything of artistic value. Often man and boy can visualize what they wish to produce and are held back by lack of skill—hands that will not instantly obey the behest of even mind and heart combined—tho this state is but a passing phase with those whose will is set on achieving. So I say again, it is significant that you have the training of the hand so prominent in our schools today. It is prophetic. If the education that a nation gives its children is the truest reflection of itself, it seems as tho the nation were saying "Restore the withered hand to life again." To what end? Why should it be restored if we are not to have an ethical interpretation of machinery? We measure the greatness of any civilization of the past by its art, by its literature, even by its crude science, but science in itself is cold and lifeless, and great harm will be done to the spiritual life of man if we develop on scientific and mechanical lines alone.

I have looked long at the different pictures of Rheims Cathedral. There you had a great example of thinking thru the hands; there you had the soul of a people expressed thru doing and feeling. And levelled against this, let loose at it, were the Krupp guns—modern machinery bent on destruction. It took all the Thirteenth Century to build Ypres, the living witness of the Flemish guild system, and in the Twentieth it was smashed to pieces in a few hours. Other ages had other ways. Mr. E. H. Blashfield points out, "Thru the Fourteenth Century Italy was a battlefield, but Giotto and his painters, Giovanni Pisano and his sculptors, Arnolfo and his architects, went up and down the battlefields unharmed and entered thru the breached walls of cities to paint allegorical pictures of the blessings of peace, in



FIG. 8. OAK TABLE DESIGNED AND CARVED BY E. FARROW, MADE BY M. J. MURDEN.

the town halls. The artist, so far as his personal security was concerned, carried the truce of God with him." Mr. Mathers of Princeton University says "Among art loving nations in the past the artist enjoyed amid wars, ambassadorial immunity." What a contrast! On the one hand, mechanism levelled against beauty in its most glorious form; on the other,

the artist immune, placed above and beyond war, consecrated to his task.

Is it true, as some claim, that we have advanced more in the arts of destruction than of construction? Is that indictment of Maud Egerton King's true when she says "This mechanical age must remain unalterably wrong even in the Labor Millenium of big money, little work and perfected hygiene, must remain wrong because it will always involve the suppression or corruption of the imagination and its tool, the hand, and will thereby prevent more beauty than the massed armies of the world could shatter, not the irreplaceable mummied beauty of the past, but the vital beauty of bud, and flourish, and the eternal renewal from the living human root?" Has mechanism done this? If so, how best can such a condition be remedied?

I do not pretend to answer these questions. These are some of the considerations I would urge altho I am aware that I have presented ideals that are beyond the possibilities of achievement in the manual training rooms. Yet this much

we can do at present: we can see that the hand of every child with whom we come in contact is developed to the fullest capacity of his mind and personality, watching that we mould the character as well as develop the ability of the nation's children. For, if our inspiration as teachers does not come from a love of moulding character and developing ability, then I know not whence its source. To mould the character of Canadian children into ways of thoroness, to develop in them the love of beauty in its simplest form, is a task that calls for all the strength of any man or woman's personality. It is great enough to call for the same quality of devotion, the same sustained enthusiasm that we find in the nations battling against Prussian militarism. And whether in classroom or manual training room this task of educating the men and women of tomorrow calls for the very finest of our men and women of today. Nothing second rate will do here. No mild enthusiasm must be brought to this task. Here, is the great constructive work. For the child is the hope of democracy.

COMMERCIAL PAMPHLETS AND "RELATED WORK."

M. NORCROSS STRATTON.

Instructor of Related Work, Practical Arts Department, State Normal School,
Fitchburg, Massachusetts.

WHAT use can you make of all those advertising booklets, catalogs and circulars?" asked a visitor to my Practical Arts Department, referring to the large number of catalogs, booklets, handbooks, etc., he noticed in my office and around the shops.

"Come up stairs to the classroom and I will show you," I replied.

We entered one room where the pupils were reading, under direction of the classroom teacher, a booklet issued by the Henry Disston and Sons entitled *How a Saw Cuts*.

"That is one use," I explained to him. "Reading lessons from such books as those are of vital interest to the boy, and we have already read several others relating to carpentry. Notable among them are Simond's, *The Professor and the Saw*, Disston's, *The Saw in History and How a Hand Saw is Made*, *The Life of David Maydole*, and also books relating to cement, some about iron and steel, a little book on *carborundum*, some about files and their manufacture, many about paper and printing presses, and some about electrical works, etc.—but you see the point—related

reading—reading and shop information at the same time, and most concerns have been liberal in sending me enough booklets to supply my classes.

"Now come into the arithmetic room. You will notice that each boy has a Simond's *Handbook for Carpenters* and a Millers Falls' *Handbook for Mechanics* on his desk."

In doing related arithmetic, reference is continually made to these and other such books for the tables, to find out the number of nails to a pound, the sizes of boxes and bins, painting data, formulas and data for metalworking problems and many other facts of interest in arithmetic.

Just now they are estimating the number of bushels of potatoes that a bin which they are building will hold. They have referred to the little red guide to find out how many cubic feet in a bushel. The books add interest to their arithmetic and they are learning to use the same reference books that real mechanics use in real work. Then too, we get about half our spelling words from such books and circulars—words that are used in the trades. The boys learn about the tools, too, while learning spelling, for most of the books are illustrated and the uses of the tools explained.

"Very interesting," said the visitor, "and I begin to see how such material might be used in other subjects like language and geography."

"Oh yes, we make great use of this material in our language work."

Our pupils write business letters to the concerns, asking for their catalogs, and they acknowledge receipt of them. They usually get letters from the concerns which are used in the classrooms for samples—

real-life business letters—and we have a filing system for taking care of such material—another education for the boy.

Our pupils are also taught to order material from catalogs, write for quotations on equipment needed and to figure the discounts quoted, etc.

In writing compositions the boys use the booklets in many ways—a special reading report is one innovation. A definite assignment is made; such as, "Read the Atlas Cement book, *History of Cement*." The pupil reads the assignment, writes his report on the special blank, and reads his report to the class. This would happen at the same time that the class is doing a real job in cement work. Oral discussions, or oral language lessons usually result from these special reports.

Many of the booklets contain pictures of the various operations in making some article—like the booklet, *From Mine to Smelter*. The class writes descriptions of the pictures, and our related geography and history are almost dependent on these commercial 'textbooks'.

We use them in dictation work, they are of value to classroom teachers for reference in obtaining a knowledge of shop terms and methods; they are of great value for bulletin board material, and we use them as samples of printing in the print shop.

"Oh yes, it costs a small amount for stamps, but we certainly get our money's worth, and the pupils are more interested. They help put life into our academic work and are of great value in our related work."

"I am convinced you do make good use of such material," said the visitor; "usually, it is collected, put away and forgotten."

Obstinacy is anything but a virtue. It is determination and self-certainty running amuck. We are all under the constant necessity of revising our opinions in the light of new evidence, and it is a sign of mental flexibility and capacity if we can do so gracefully and candidly.—THE PACE STUDENT.

HOW I STARTED MY EIGHTH GRADE CLASS THIS YEAR.

This article belongs in the same series as the one in the December number entitled "How I Started my Seventh Grade Class this Year." The purpose of the series is to stimulate more interest in the vital subject of methods of teaching shopwork, and to encourage an exchange of experiences and ideas. We hope that readers will volunteer to describe their own methods, and to discuss methods explained in the articles of this series. Let us have a round-table discussion in print.—THE EDITORS.

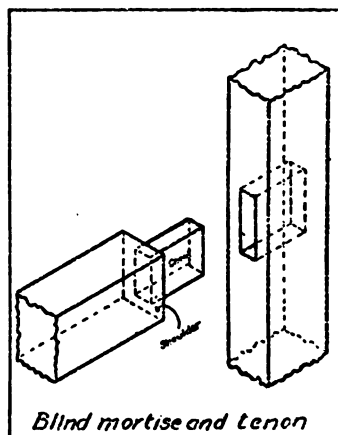
BOYS in the sixth, seventh, and eighth grades come to our department for manual training. Each class holds session a half day each week. Allowing for variations in degree of advancement, all are given the same instruction in class, and individual instruction as needed.

The first session was spent in assignments and class instruction. Each boy was assigned a bench for the term. The order of the room, the lockers, materials, supplies, checking out of tools, etc., were explained. The use and the order of the machine, stock and the glue rooms were taken up. Questions relating to woodwork were answered.

The first woodwork was an exercise piece, and was required of all. The mortise-and-tenon joint was given as the exercise piece, since it is distinctly a typical joint of the highest order, involving many tool processes—a review of the sixth and seventh grade work. A printed sheet of directions was given each boy; all were instructed to follow these carefully. The dimensions required were given, and until a boy made a "passable" joint, he could not take up the next work.

Mechanical drawing has been given for a half session on alternate weeks. Each eighth-grade boy must make a working drawing of some piece of furniture or woodwork which he is making in the shop.

After the exercise piece was "passed" by the instructor, the boy made at least one "individual" piece. The designs are the individual problems of the pupils, and with the necessary aid, many good ideas are secured.



My eighth grade classes are making many fine pieces of furniture, and in some instances these are very pleasing departures from the old standard projects. The pedestal, dining chair, Morris chair, library table, hall writing desk, cedar chest, medicine cabinet, upholstered stool, and the ski suggest the character of the projects which the boys design. Naturally, the less advanced boy has had to content himself with some small project.

Brief talks on construction and design have been given. All shop problems are brought up in class instruction period.

The shop is run partially as an industrial plant, but the boy is continually reminded that he should learn something while he works.

CLYDE I. WEST,

Department of Manual Training,
Joliet, Illinois.

AS A RULE, boys of the eighth grade come to the manual training shop at the beginning of the school year fully expecting to make something "worth while." I have found this to be the case when discussing the question of projects at the outset of the term. At this time my ability as a diplomat is put to the test.

I seek refuge behind my course of study, inasmuch as the first project for the eighth grade introduces the problem of working to three dimensions. Heretofore, the pu-

pils have dealt only with the question of width and length. In demonstrating this first problem, the hat-and-coat rack, I emphasize the importance of squaring up stock to three dimensions. I have the rules for this process printed on the blackboard, there to stay, until the end of the year. I also lay great stress on the question of following these rules in all the work of the term.

I believe that this problem, involving three dimensions, adds to the importance of shopwork in the estimate of the boy. I aim to present it as one which involves the working principles of cabinet work and joinery in general; and as a stepping stone to the big things they had in mind previous to their conversion (?)

—T. E. JONES.

Cleveland, Ohio.

A SCHOOL-BUILT GYMNASIUM

E. E. BIDDLE.

Instructor in Manual Training Union High School, Red Bluff, California.

WE WERE in need of a gymnasium—one that would be large enough to accommodate a basket ball game, which always draws a large crowd in this locality. Of the \$90,000 voted for a new high school building, \$5,000 was set aside for a gymnasium, with the understanding that the boys were to build it. Plans were prepared by the school for a structure 60x90 ft.

The foundation was laid in May, 1916, before the close of school for the summer vacation. At the opening of school the following October we began operations by laying the mud sills. The foundations are of concrete; the walls are 8" thick with 24" footings, and they average 2 ft. in height. The central part of the floor is supported by piers 7 ft. on centers one way, and 10 ft. the other, making 84 piers in all.

Every 10 ft. is a girder built up of 2" x 12" welt, spiked together. On these are the joists, which are 2" x 12", placed 16" on center, over which is laid a rough floor of 1" x 6" Oregon pine. When enough of this was laid, the side walls were framed.

The studding of the side walls are 2" x 6"—24 ft. long, and were rather heavy to raise to place. For this reason they were all framed on the floor; that is, each opening was framed so each piece was the right length, and then raised to its place, one piece at a time.

The walls are sided with 1" x 6" Oregon pine up to a height of 14 ft. and above that with 1" x 4" flooring, turned rough side out to make the inside finish above the galleries.

The trusses to support the roof, five in number, and 14 ft. apart, spanning 60 ft.,



1. RUNNING THE LEVELS.



5. FRAMING A SECTION ON THE FLOOR READY TO RAISE.



2. DIGGING TRENCHES FOR THE FOUNDATION.



6. RAISING THE FRAME.



3. BUILDING THE FORMS.



7. THE DOUBLE STOREY PART AS IT WAS FRAMED



4. PUTTING IN JOISTS, LAYING FLOOR AND FRAMING REAR END ALL AT ONCE.



8. EAST SIDE VIEW.



9. INSTRUCTOR OVERSEEING THE WORK.



13. LOOKING THRU THE TRUSSES.



10. THE SAW WHERE MOST OF THE CUTTING WAS DONE.



14. PLACING THE ROOF BOARDS.



11. BUILDING A TRUSS.



15. PLACING THE ROOF BOARDS.



12. BUILDING THE LAST TRUSS.



16. SOUTHWEST VIEW.

were built on the bridge-truss plan; these, in addition to supporting the roof, carry the galleries which are suspended by rods. As fast as the trusses were completed, the rafters were put in place, and the roof boards nailed on. There being no ceiling inside, we used 1" x 4" flooring upside down for the roof boards. On this a composition roofing was placed. This part was let to an out-of-town contractor.

The outside walls were papered with a two-ply ready roofing, and stripped every eight inches apart with strips $\frac{3}{8}$ " thick, 1" wide and 16" long, over which was nailed 1" mesh chicken wire, No. 18 gage, galvanized. On this a cement plaster was applied.

The front part of the building has two stories in height. This extends back for 18 ft. and contains the boys' dressing room and apparatus room down stairs, and the girls' dressing room and band room up stairs. These rooms are finished in tongued-and-grooved wainscoting. The band room has a maple floor while the showers have cement floors.

The main gymnasium has a gallery on three sides and will accommodate 500 people.

The walls are finished with wainscot-

ing all around and up to 3 ft. above the galleries. The end gallery is high enough to permit a game of hand ball.

The main floor, covered with maple, is 59 ft. wide by 75 ft. long, giving us a basket ball court which is 69 ft. between baskets and 45 ft. between galleries.

While constructing this building I endeavored to lead the boys as much as possible by going ahead and allowing them to follow. After they were well started, I stopped and let them do the work. By so doing the enthusiasm has been retained.

The boys have surprised the citizens of Red Bluff in the results, as many felt the work would be poor and the building not amount to much. But my practical training in the building business gave me some advantage over the average instructor.

After four months' experience in handling sixty-three boys, I feel safe in saying that an instructor who undertakes to build a \$10,000 building, should have at least a working knowledge of the house framing trade.

Our gymnasium, when completed, will cost about \$8,000 besides the labor, which will mean a saving to the districts of about \$2,000.

COMMERCIAL CONDITIONS IN A SCHOOL PRINT SHOP.

C. F. LEBOW.

Instructor in Printing, Salina, Kansas.

ONE of the live topics of discussion among manual training men these days is "Commercial Methods in School Shops." It is appearing in one form or another on the programs for manual arts round tables at state conventions and wherever teachers are brought together. So far, there seem to be about as many opinions on the question, as there are

speakers on the programs, and much is being said on all sides of the subject.

Whether commercial methods are practical or not for the woodworking shop may still be a matter of personal opinion but that they are intensely practical for the work in printing is being demonstrated in the print shop of the Washington High School in Salina, Kansas. The system was

introduced last year and was found to be so successful that it is already in operation this year. This print shop gets out all the printed matter used in the school itself and up to this year all that was used in the entire school system. This year a shop in the junior high school is doing its share toward supplying the demands of the school system. In addition to this printing, the Washington shop last year printed a monthly school paper of 46 pages. A great deal of individual printing was done by each member of the printing classes beside.

In order to handle the large amount of printing which was demanded of the shop, a system of shop foremen was instituted as an experiment. The work of the shop was divided into composing room and press room output and one boy was designated as foreman of each department for a period of one week at a time. The foreman was made responsible to the instructor for his department only. He was allowed to designate any boy in the class for any job he wanted done. After a short time the foremen found that they could work in harmony without designating the same boy for two jobs at the same time.

The instructor acted as the superintendent of the entire shop and it was found that the actual instruction which each boy received was more concrete and definite than when the class was taken as a group. The boys who were foremen got the most out of the experience, but as each boy was foreman for but one week at a time, each boy had an opportunity to get his share. Naturally the foremen ran against all kinds of snags and difficulties, but whenever anything came up which they did not

understand it was explained to them carefully and thoroly in order that they might in turn explain the proposition to the workmen under them. The whole scheme tends to place responsibility upon the pupils and it has been found that the pupils do their utmost to "deliver the goods." A boy who might be inclined to be a loafer (all manual training men have them to contend with) has been found to develop into a real leader under the shop foreman system.

When the system was first introduced the boys were a little diffident about designating certain boys for certain jobs but they soon found that it was to be taken seriously and that the instructor was back of them. After that it was a matter of rivalry to see who could get the most out of the shop in a week. They soon came to realize that a boy who was foreman was to be respected, not so much because he knew more than the rest of the class, but because he was the foreman. The fact that some other boy was to be foreman next week had a tendency to discourage any insubordination, for a boy knew that sooner or later he would be foreman and would be expecting the rest of the class to do as he said.

The classes last year ranged from ten to seventeen in number and in the larger classes two foremen were used, but in classes up to twelve in number one boy can handle either the composition or the press work easily. The plan works successfully in Salina and might be used to solve the problem of some other printing instructors who have a heavy demand upon their shops.

The only really universal training which we can adopt after the war is a training for social service, because the only universal training is training for social service.

—PROFESSOR JOHN DEWEY.

EDITORIAL REVIEW OF THE MONTH

IN SEVERAL cities the depletion of the staff of manual training teachers on account of war service, and the impossibility of filling their places at once with competent men has brought forward a difficult question for immediate decision. Already this condition seems to have arisen in Cincinnati, Cleveland, Chicago and Minneapolis, and doubtless it has begun to appear in every other city of considerable size. How shall this emergency be met?

We have heard two suggestions. One supervisor is quoted as saying, "I can't see what can be done unless women take up this branch more generally and qualify for the positions." Another supervisor has said, "I will close down my manual training shops before I will recommend that women be employed for this work." Thus it appears that this new situation reopens a question that was discussed ten or fifteen years ago, and seemed to have been satisfactorily settled.

There is no question as to the capacity of women to do the technical processes of the work in the grammar grades. They have done it, and in some cases they have become successful teachers. But the question is not one of technical ability. Why not employ men to teach cooking to the girls of the elementary schools? If trained for it they would develop the technical ability. The question is fundamentally one of physical fitness and custom. Women *could* build houses and construct locomotives, but under normal conditions they do not. They ought not. It is a man's job to do either. Men *could* take care of babies and make dresses and cook home dinners, but as a rule they don't do it. It's a woman's job. Nature and custom have so decreed.

In the elementary school the manual

training shopwork and drawing very distinctly represent man's occupations. In many schools the manual training shop is the one place where a boy can come in contact with a man in the capacity of teacher. It is the only place where he gets the man's point of view. There is, and there must continue to be a difference between a woman's attitude toward an occupation which naturally belongs to man and a man's attitude toward the same occupation, and the woman's attitude is necessarily reflected in her teaching. While a woman can readily acquire skill in mechanical occupations she very seldom looks forward seriously to work in the higher and more difficult parts of these occupations as a means of livelihood. With a man it is quite otherwise. Unless we want to have the manual training shopwork kept to a stereotyped series of schoolish problems, more and more removed from practical industry, we should not turn our manual training shopwork over to women.

This is especially true at this time when manual training is being scrutinized with reference to its capacity to function on the vocational or practical side. Manual training shopwork is undergoing a development in the direction of the vocational (wherever it is given sufficient time to do so), which is enabling it to fulfill its mission as it never has been able to do it before. To turn shopwork over to women would certainly be to turn the hands of the clock backwards.

We therefore, agree with the supervisor who would temporarily close his manual training shops rather than start out upon a policy that would put women in the places of men in manual training work. There would be no quicker way to kill manual training in the grammar grades

than to very generally turn the instruction over to women. Such a policy, even as an emergency measure, would be dangerous for manual training.

A SATURDAY AFTERNOON SCHOOL.

AT THE present time when special efforts are being made to adjust the schools to suit the convenience of industrial workers, farmers, clerks, and, in fact, anyone else who wants to get inore school training, a suggestion may well be taken from the Saturday Afternoon School conducted at Houston, Texas, under the direction of E. M. Wyatt, director of manual training. This school grew out of the discovery and putting together of two very simple facts. The first of these was that many students in the night schools found difficulty in attending, and others who wanted more schooling found that the physical strain of attending a night school after working hard all day was too severe for them. The second fact discovered was that many of these same people were free from work on Saturday afternoons. Then came the thought that probably they would like to attend a school at that time.

Consent was secured to open a Saturday afternoon school in the Central High School building, beginning at the same time that the night schools start. The new school was announced in the newspapers, in street-car posters, in hand bills, circulars thru office buildings, and a few circular letters were sent to large employers of labor. Mr. Wyatt gives the results in the following paragraphs:

The response was most gratifying. The first day 400 students enrolled for work under 13 teachers. This enrollment exceeded the enrollments ever reached by any but one of our night schools. The school was a success from the start. During the six months' term the total enrollment reached 531, of whom 373, or 70 per

cent, were women and girls. Only 108, or 20 per cent, were under 21 years of age.

Work was offered in the following subjects: Architectural drawing, mechanical drawing, guilders' mathematics, arithmetic, English, Spanish, electricity, advertising, plain sewing, dressmaking, millinery, cooking, dietetics, shorthand, typewriting, spelling, bookkeeping, blueprint reading, automobile mechanics.

The enrollment in cooking, dressmaking and millinery increased so that several classes had to be organized in each of these subjects, and often where laboratory room was limited, waiting lists had to be kept for students desiring to enroll. Only the classes in English, electricitv and one arithmetic class were discontinued because of small enrollment and attendance.

Our class in sheet-metal work was organized at the special request of the Sheet Metal Trade Union who require the attendance of all the Union's apprentices.

The school was organized in the most flexible manner possible to meet individual needs. Being new, the schools had no teachers' traditions and few were borrowed. Four one-hour periods were provided and students enrolled for periods they saw fit. Teachers were employed only for periods where the class enrollment for these periods demanded a teacher's time. Several subjects were given double periods, as drawing, cooking, sewing, automobile work and advertising. Not all subjects were given for the full six months. Millinery was taught in two six-weeks' courses, one for the fall millinery and one for the spring millinery. The automobile class was divided into two three-months' terms.

Mr. Wyatt believes that a large number of short-unit courses would be desirable in the future. He is of opinion, also, that in such a school, where students and teachers meet only once a week, it is desirable that no preparation work be expected of the students; six days in which to procrastinate is long enough to defeat home study.

The cost of the school to the city was \$860.75 for teachers' salaries and a little coal for heating the building. Concerning this expense Mr. Wyatt says, "I feel

that the city never spent a like amount doing a greater good."

GARDENING AS PATRIOTIC SERVICE.

FOR a man to plant and take care of a vegetable garden covering the back end of his home lot, and even to add to that a vacant lot or two nearby, does not seem like a patriotic service, because the garden yields vegetables that are worth money to the gardener. Moreover, the gardening provides him with invigorating exercise in the open air when he is much in need of it; and further, it rewards him with the spiritual joy of contact with Nature when she is most inspiring. Indeed, from the viewpoint of the individual gardener it seems to be entirely over-rating such profit-pleasure activity to speak of it as patriotic. Like purchasing liberty bonds, it is a good investment, whatever else it may be.

But looked at from a social viewpoint—from that of national need and national production, there is another and sufficient inducement for cultivating a garden in 1918. It is when the grand result of thousands of such little gardens is brought before us that we see that what is pleasure and profit to us may be patriotic service to the nation. The results of last year's "emergency war gardens" have been brought together thru a nation-wide survey, and the facts are given in the following summary:

The survey located nearly 3,000,000 gardens, aggregating 1,150,000 acres of city and town land under cultivation. Says the National Emergency Food Garden Commission: "As these gardens were tilled intensively, and the products had relatively high value, being figured in terms of retail prices which would have otherwise been paid for food purchased elsewhere, it is estimated that their yield was valued at \$350,000,000, or \$17.50 per family."

Furthermore, the benefit extends beyond the harvest season—beyond the time of fresh vegetables. For the glass-jar manufacturers sold

about 119,000,000 canning jars this year, and a survey of the household canning in 20 typical towns thruout the country showed that housewives used but one new jar to over 3½ old jars already on hand. On this basis the housewives of the country put up nearly 500,000,000 quart jars of vegetables and fruits, which is believed to be three times as much as was ever packed before.

Not every garden was successful; someone has estimated that of all the gardens begun, perhaps 25 per cent failed. Even if this is the fact, says Charles Lathrop Pack, president of the commission, it is reasonable to suppose that not more than 10 per cent will fail next year. Experience is a great teacher.

Moral: Begin early to plan your garden for 1918.

SCHOOL ART LEAGUE OF NEW YORK CITY.

THE School Art League of New York City has been organized for the purpose of aiding in every practical way the training of children "in taste and in industrial art knowledge." The League holds that in the present crisis there is an imperative need of conserving and training the powers of children who are especially gifted with a sense of color and design. The League urges the establishment of an industrial art school and the foundation of industrial art scholarships designed to keep the strongest pupils under instruction until they have been trained to produce their best. In this respect the League would follow the example of European countries.

The activities of the League during the year of 1916-17 included: (a) 61 Lectures and meetings for children and for members at the Metropolitan Museum, at the Brooklyn Museum, and at the Fine Arts Building. (b) The docent spoke in 226 classrooms in the elementary schools, and met 102 classes at the museums. (c) A plan has been developed which makes it possible for every high school in the city to award annually an

industrial art scholarship to some talented pupil. Each school pays one-quarter of the required fee; the League and the co-operating art schools provide the balance. Under the arrangement three high schools have established scholarships; several others are preparing to do so thru the sale of art objects made by the pupils. (d) Fine craftsmanship medals to the number of 487 were awarded in the workshops of the elementary schools. The Alexander medal "For Merit" was awarded at the close of the second year in the twenty-four high schools of the city. Two new medals were established in 1917. One founded by the Art in Trades Club is to be awarded for excellence in design at the close of the first high school year in each of the high schools. Mrs. Helen Foster Barnett has founded the "Saint Gaudens Medal for Fine Draftsmanship," and this is to be awarded in the third year of the high school.

The League is maintained thru \$5 membership fees and gifts. The expenses last year were about \$3,600.

MAKING AMERICANS.

WHEN you need an antidote for the depressing effect of talk about the defects of American institutions you should read "Where Garments and Americans are Made" by Jessie Howell Mac Carthy. This is the story of Marja, "a composite girl" in the school for Americanizing immigrant factory workers maintained jointly by the New York City Board of Education and the muslin underwear factory of the D. E. Sicher Co. If the stars in the flag don't look a little brighter after reading this book* we advise you to see if there is not something wrong with your mechanism of response to patriotic stimulus.

*Published by Writers' Publishing Co., New York.

This unique school is maintained in a factory. The girls are taught in actual working time for which they receive pay. For three-quarters of an hour each day for a year each girl in school receives practical instruction in "speaking and writing the English language, the composing of personal and business letters, the fundamentals of arithmetic, history, and civic government, good citizenship, local ordinances, hygiene and sanitation, the industrial evolution of the product they handle from the cotton fields to the machines they operate, and the mysteries of communication so puzzling to the foreigner—the use of the telephone and city directory, the sending of telegrams and letters, and the finding of one's way in the city streets."

This factory school has been a decided success. Even from the strictly business point of view (tho that view is by no means the only one with Mr. Sicher), it pays its way. Mr. Sicher says that "the doing away with illiteracy by the educational training these girls receive improves their efficiency and earning power. This in turn reacts favorably upon the business. They give back in efficient labor all that it costs to instruct them part of each working day." From the standpoint of the individual girls and of the Nation, this school opens up a new vista of usefulness for the American public school.

PEDAGOGY CLARIFIED.

A FEW days ago we received from William A. Aery, of Hampton Institute, an interesting account of the work being done at the Instructor Training Center at the Newport News Shipbuilding & Dry Dock Company by Charles R. Allen, formerly state agent in charge of industrial training for the State of Massachusetts. What impressed us

particularly in this account was the statement that Mr. Allen is presenting the fundamental facts of pedagogy in the every-day language of the men in industry. Instead of talking about "determination of content, organization of content, methods of instruction, and class management," he covers all these when he answers the simple questions: "What are you going to teach? When are you going to teach?"

How are you going to teach?" If this work now being done under the Emergency Fleet Corporation can reduce some of the foreign language of modern pedagogy to ordinary every day English, we have no doubt many who are outside of the great workshops of industry will profit by the change. We have seen college students who would thrive on Mr. Allen's simple statements of fundamental facts.

WASHINGTON CORRESPONDENCE.

TECHNICAL TRAINING INVENTORY.

AT THE request of the Council of National Defense, the Department of the Interior, thru the Bureau of Education, is preparing an "inventory of facilities for technical training in the United States." There is an increasing shortage of trained workers in many mechanical industries and clerical occupations. It may prove necessary to call upon institutions equipped to train persons for such occupations to use their facilities more largely than at present. To meet war emergencies, therefore, the Government needs an immediate inventory of available facilities.

A schedule asking for desired information has been prepared and sent to all institutions on the lists of the Bureau of Education that might be able to make some contribution, including approximately 125 engineering and technological schools and colleges, 200 technical and trade schools of secondary or higher grade, and 9,000 high schools having four-years courses, many of which have at least a minimum of equipment for woodworking and drafting. The following is quoted from Commissioner Claxton's letter of transmittal:

It is understood that many of the institutions addressed have not been engaged in the work

of training apprentices or skilled mechanics or offering business courses. Nevertheless, the need for quick action is compelling, and the stress of necessity may demand the utilization of all available resources, from the manual training woodworking shop to the steam engine and hydraulic laboratories of the engineering college. Emergency conditions may at any time require concentration upon some given line of training in some particular locality.

The schedule is accompanied by a letter from Secretary Lane, in which he asks:

What can your institution do toward enabling the industries of the country to keep up with the demands made upon them? If the Government should find that there is a shortage in draftsmen or electricians or machinists, for instance, what number of men could you under pressure, bending yourselves to the job, provide to meet this national emergency?

This is the standpoint from which this inquiry is made. We ask the steel plants and the shipyards how much steel they can furnish, or how many ships within a certain time, and we wish now to know what our educational capacity is.

CONFERENCE OF SPECIALISTS.

A VERY successful conference of specialists engaged in training teachers of manual arts and industrial education was held at the University of Missouri, December 13, 14, 15, 1917. The leading institutions of the Mississippi Valley were represented in the conference,

which was called by the Commissioner of Education. There were present 20 official representatives of 18 institutions in 12 states, the territory covered extending from Minnesota, Utah, and Texas, to Ohio and Tennessee.

The principal topics of discussion were: Federal aid under the Smith-Hughes Act for the training of teachers of trade and industrial subjects; methods of examining and certificating special teachers; practice teaching in the preparation of special teachers (Study of existing curricula; Present conditions with respect to practice teaching; A proposed program); Content of courses of study in shopwork for the elementary or junior high school. A summarized report of the proceedings has been prepared for distribution, copies of which may be obtained upon application to the Bureau of Education.

PLANS OF ALL STATES APPROVED.

PRIOR to December 1 the plans of 22 states had been approved. At the regular meeting of the Federal Board, December 14, 1917, the plans of 17 additional states were considered and approved, and these states were certified to the Secretary of the Treasury as having complied with the terms of the law entitling them to Federal aid. They are:

Alabama	Montana
Colorado	Nebraska
Florida	North Carolina
Indiana	Ohio
Iowa	Oregon
Kansas	South Dakota
Michigan	Texas ¹
Minnesota	Washington
Mississippi	Wyoming

At a special meeting of the Board, called Friday, December 28, the plans of the remaining nine states were approved:

¹The Texas plans were partially approved in October, 1917.

Connecticut	Missouri
Idaho	Maryland
Illinois	Rhode Island ²
New Hampshire	Vermont
North Dakota	

Rhode Island was the last of the 48 states to submit plans complying with the requirements of the Act, the delay being caused by the absence of the governor in Europe. The staff of the Federal Board has displayed great energy in arranging and holding the necessary conferences with the representatives of the states, in examining in detail the plans submitted, and in completing this important task by January 1st, the latest date on which a state could be certified under the law to receive its instalment for the first quarter of the fiscal year beginning July 1, 1917.

The total amount of Federal money available for the use of the states in the promotion of vocational education during the current fiscal year is \$1,660,000. Every dollar of this amount must be duplicated by a dollar appropriated by a state or community, making a total of \$3,320,000. Further, these figures represent the amount spent for salaries of teachers only, except in the case of the fund for the training of teachers. It has been estimated that the expenditures for salaries of teachers in a state-wide scheme of vocational education represent roughly 50 per cent of the total cost of maintenance. It is evident, therefore, that if the 48 states succeed in carrying out the proposed plans the aggregate amount spent during the fiscal year ending June 30, 1918, for the promotion and maintenance of vocational education, exclusive of permanent investment in buildings, will be not far from \$7,000,000, including \$200,000 in the budget of the Federal Board.

²Approved for fund for "salaries of teachers of trade, home economics, and industrial subjects" only.

TRAINING RADIO AND BUZZER OPERATORS.

THE schools of the country have responded promptly and vigorously to the suggestion, originating with the Federal Board for Vocational Education, to organize special classes for the training of radio and buzzer operators in large numbers for the Signal Corps. Experience has shown that in an intensive course of about 200 hours the ordinary recruit can attain the ability to send and receive messages at a minimum rate of 20 words, averaging five letters each, per minute, under the conditions of the classroom. Men who attain this speed in the training classes will receive appropriate certificates, and will be given further instruction under field conditions after arrival at the cantonments.

In cooperation with the War Department, the Federal Board prepared and distributed widely Bulletin No. 2, a manual "for use in training conscripted men for service as radio and buzzer operators in the United States Army." Reports received by the Federal Board indicate that approximately 4,000 men are or have been receiving instruction in more than 120 schools in more than 40 states. It has been stated that the Signal Corps alone will require a total of 15,000 operators.

By admitting to classes only conscripted men who have passed a physical examination and who are certain to be called to the service in the next or succeeding drafts, the schools will be rendering a patriotic service of great significance in this emergency. Men who have not the requisite qualifications to become successful operators will be identified and eliminated, while the graduates will constitute an available source of candidates for further special training, with definitely known attainments beyond the preliminary and elementary stages.

TRAINING IN SHIPBUILDING OCCUPATIONS.

IN ADDITION to the program of instruction in the shipyards organized by Mr. MacNary under the Industrial Training Section of the United States Shipping Board, outlined in previous numbers of this MAGAZINE, the Federal Board for Vocational Education proposes to assist in this emergency also. It has authorized the use of Federal funds in subsidizing part-time and evening classes for the training of men employed in shipbuilding occupations, when organized in accordance with approved plans submitted by State Boards for Vocational Education.

The Federal Board, thru its Department of Research, employed Prof. K. G. Smith, of the Iowa State College of Agriculture and Mechanic Arts, to make a study of the occupations in the shipbuilding industry, including an analysis of allied occupations. As the result of this investigation, suggested short-unit courses of study have been formulated for use by state boards and communities in organizing training classes. These suggestions have been published in revised form as Bulletin No. 3.

State boards have been urged to co-operate in every possible way in the promotion of training of skilled workers in shipbuilding occupations, and field agents of the Federal Board have been directed to give these projects special attention.

CONFERENCE OF STATE OFFICIALS.

REALIZING the need for immediate action in mobilizing resources for industrial education in many lines to meet war emergencies, the Federal Board called a conference of state officials for vocational education, which met at the Cosmos Club, in Washington, December 19, 1917. At this conference the following resolutions were adopted:

Whereas: A very grave situation exists at the present moment because of the demand for specially trained men both for occupations required in the army itself and in industries engaged in supplying the needs of the Government; and

Whereas: The State Boards for Vocational Education cooperating with the Federal Board for Vocational Education have inaugurated a system of special courses for the training not only of shipbuilders, machinists, tool-makers, gage-makers, foremen, radio and buzzer operators, but of more than half a hundred other occupations requiring technically skilled men; and

Whereas: Over 50,000 men are now being trained in the technical and evening schools of the country and these schools are now asked to assist in the training of over 200,000 men for the various branches of the Army;

Therefore, Be it Resolved:

(1) That it is the opinion of this Conference that the Federal Board for Vocational Education use its good offices and position to impress the Provost Marshal General with the necessity of issuing the necessary instructions to exemption boards to classify in Class 3 all persons giving instruction to conscripted men, as well as instructors engaged in the training of workers for essential war industries and for agriculture; these instructors to be detailed back to the schools where they are now giving instruction.

(2) That the situation with regard to special industrial training is so serious, and the demand for trained men entails so great an extra expense for maintenance and equipment for the state and local authorities undertaking to comply with the request of the War Department made thru the Federal Board for Vocational Education, that the President of the United States is requested to appeal to the governors of the respective states urging them in turn to appeal to the municipal authorities, so as to secure the enactment of legislation and the appropriation of the necessary funds to carry on this work both as a state and as a local matter.

(3) That the Council of National Defense be urged to make a similar recommendation to the State Public Safety Committees or State Councils of Defense, urging them in turn to make an appeal to local Public Safety Com-

mittees for active cooperation in promoting and financing the education of conscripted men and men to work in the war industries.

(4) That it is the opinion of this Conference that conscripted men enrolled in special classes for the purpose of training for occupations desired by the Army should be permitted to remain in those classes until such time as they shall have arrived at a degree of proficiency sufficiently high to avoid the serious loss of time, money, and energy which would be involved if these men were sent to the cantonments before finishing, in part at least, this training

THE GENERAL INDUSTRIAL SCHOOL.

NOT all the time and energy of the staff of the Federal Board are devoted to war emergency work. Whatever may be the immediate demands of the hour, the necessity remains for laying proper and adequate foundations for a permanent national system of vocational education. Numerous questions of policy are continually before the Board, one of the most interesting of which relates to procedure in the small community.

The law provides (Sec. 11) that in cities of less than 25,000 population the conditions as to length of course and hours of instruction per week for students who have not yet entered upon employment may be modified to meet the particular needs of such cities and towns. The Federal Board has not yet formally announced a policy with reference to the "modifications" that may be made under the terms and spirit of the Act, but it will undoubtedly be obliged to do so in the near future.

The unit-trade school, in which the boy spends all of his shop time in training for some one trade, is practicable only in cities in which the demand for workers is sufficient to warrant the organization of such special trade classes. In the small cities, therefore, "general industrial schools"

have been established, in which the aim is to give each boy some practical shop experience in a number of trades selected with a view to meeting local industrial conditions so far as possible. The shop-work is accompanied by instruction in related technical subjects, including drawing, mathematics, and science, together with instruction in language, civics, physical training, and other subjects necessary to a well-rounded course.

It is evident that it will be found desirable and profitable to organize many such schools with but one or two or three teachers. Complete division of labor will be impossible. The same teacher will be called upon to teach the elements of two or more trades, and frequently the related technical work as well.

There are, therefore, three important phases of this problem of vocational education for the small community in respect to which the Federal Board will be asked to formulate policies and to review the proposals of State Boards: (1) The content of the shop courses of study in the general industrial school, necessarily different from that of the courses in the unit-trade school; (2) The qualifications to be demanded of the teachers; (3) The task of the institutions which are to prepare teachers for the general industrial school.

THE following Bulletins have been published by the Federal Board for Vocational Education:

BULLETINS OF THE FEDERAL BOARD.

No. 1. Statement of Policies. In 70 pages this bulletin summarizes the provisions and requirements of the Smith-Hughes Act, and the results of a series of conferences with representatives of the State Boards, held in Washington, August 17-19, 1917. The discussion is arranged in the form of answers to questions, classified under four heads: (1) Questions of a general nature; (2) Relating to agricultural education; (3) Relating to industrial education; (4) Relating to home economics. An appendix contains the text and synopsis of the Smith-Hughes Act, and statistical tables showing the amounts available under the Act.

No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators. This is a 14-pp. circular of information for state and local boards, containing practical suggestions as to organization and equipment; advertising for, classifying, and enrolling students; courses of study, teachers, and methods of teaching; records, reports, and certificates of attendance.

No. 3. A Study of Occupations in the Ship-building Industry.

No. 4. A Study of the Mechanical and Technical Training of Conscripted Men for the Aviation Service.

Copies of these publications may be obtained by those interested upon application to the Federal Board for Vocational Education, 8th and G Streets, N. W., Washington, D. C.

No wonder Ruskin lamented over the sad proof of history that men and nations were made and strengthened by war, and weakened and unmade by peace. He might also have added that the history of men and of nations showed that men were made by poverty, adversity and so-called misfortune, and awakened by wealth, success and so-called good fortune. The truth is that men and nations are made by action and not by inaction. It is not the goal attained physically, mentally or financially that creates anything. The creation and the blessing are in the effort, the strife, and not in the attainment.

—COLUMBUS STATE JOURNAL.

OPEN QUESTIONS

"There is more to be said on this subject."

VERTICAL OR SLANTING LETTERS.

My dear Mr. Editor:

Mr. "F" asks whether he should teach vertical or sloping letters to his seventh and eighth grade classes.

This question occurred to me several years ago and so I put it to the head draftsman of an establishment of some size. In answering the question he said that he had found, in spite of a supposedly uniform slope, that each draftsman had a different angle for slant lettering and in order to produce uniformity he had adopted the vertical letter.

If it is difficult for experienced draftsmen to produce a uniform slant in letters, how much more difficult it must be for seventh and eighth grade students. I have used both styles and have finally adopted the vertical letter partly for the reason stated above, and also because I believe that it is more easily taught, that the student is more able to understand its essentials, and, as the predominant lines on this class of drawings are either horizontal or vertical, that this style looks better.

Very truly yours,

T. T. L., West Palm Beach, Florida.

At this stage of the discussion it may be well to point out the following:

1. While the inclined letters are most common in machine drafting vertical letters are almost universally used in architectural drafting.

2. In the early days of teaching mechanical drawing in public high schools the experience and thought of the teacher and the correlating courses in shopwork led quite naturally toward the practice that is common in machine drafting. The line of progress for the manual training student was (1) joinery, (2) pattern making, (3) foundry work, (4) blacksmithing, (5) machine tool work. The drawing was to harmonize with these. This meant machine drafting and the preliminary mechanical drawing.

Now the conditions are changing, and changing rapidly in some sections of the country. Outside of the large manufac-

turing cities a boy is more likely to come into working contact with the building trades than with the machine trades. He may often come in contact with an automobile, but he is not as likely to make plans for building an automobile as he is for building a garage to put it in, or a house for his family to live in. It has been seen by some of the school men that architectural drawing is destined to have a greater place than machine drawing in the average high school. Moreover, it will correlate with the newer courses in carpentry, cabinet making, cement work and electric wiring that are coming into the high schools.

3. 'If a course in elementary mechanical drawing is to precede both the architectural and the machine drawing courses, as now seems desirable, it should obviously lay the foundations for both the vertical lettering of the architectural drafting and the inclined lettering of the machine drafting. Furthermore, if elementary mechanical drawing is to be also a preliminary step to commercial designing, as is the case in some schools, the lettering should not be confined to the Reinhardt alphabet.

4. These three propositions lead to a question which is not one of drafting-room practice, but one of pedagogy: How can we best teach the fundamentals of lettering? This question, in turn, leads to another: What are the fundamentals of lettering?

This second question seems to have been answered by many writers substantially as follows: (a) form, including proportion,

(b) stroke, (c) spacing. The problem now becomes, How can we best teach the fundamentals of these three so as to function later in both architectural and machine drawing, and, some of us would add, design also? When the problem appears in this form we think most teachers

will say, "To teach form, use an alphabet of simple but fine-proportioned vertical letters." Many will add, "Get your proportions from the old Roman letters." Make a hairline letter which, when serifs are added, will be a good foundation for an architectural style, and when tipped forward will be a start toward a good machine drafting style.

So far as stroke is concerned it is as easy to pass from the vertical to the inclined as from the inclined to the vertical. Spacing, also, is much the same in both. It is a matter of visualizing, drawing, judging, and repeating until the process becomes almost automatic. Practice, thoughtful practice for brief periods not too far apart is essential.

Are these propositions sound? Who will answer next?

FAVORS A WIDE EXPERIENCE IN SHOP-WORK.

Editor of Open Questions:

In reply to the question raised by H. A. H., I would recommend for the conditions presented that the work of the school should correspond to the needs of the community. From my experience in country schools of the Middle West, I am convinced that the kind of work most needed is a strong course in farm mechanics. By that I mean engines, batteries, splicing of ropes and belts, and the construction of projects for farm use. In mechanical drawing I would study the various types of building construction, especially the farm power plant which would offer all kinds of problems in arrangement of machines, shafting and pulley speeds. Such problems are not too difficult for any sort of country school or even that of the smaller city.

Another activity which serves a useful purpose is the study of drainage. If it is not possible to buy a transit and level, fairly good results can be obtained by use of the triangle method and the ordinary level.

The above outline would involve the study of carpentry, metalwork and concrete, and I am an advocate of giving a wide experience, —a trying-out course to every boy in the lower

high school grades, so that he may have an opportunity to measure his ability, and initiative, and perhaps choose his vocation.

I believe that if such a course as I have outlined is organized in a farming community it will have the approval of the people, and the chance of putting the shop course on a par with the rest of the school subjects is assured. Manual training as I have seen it in many communities deserves little time—at least ought not to have school time. It would serve a better purpose if relegated to the scrap heap.

What we want and need is a course that has a vital relationship with life,—now, not what it was in Otto Saloman's time, or even back in 1900.

It is the business of our so-called industrial schools for teachers to get busy and give us teachers prepared to handle situations such as this question raises.

Oakmont, Pa. —BERNARD A. BEINLICH.

A COLLEGE DEGREE OR TECHNICAL TRAINING AND TEACHING EXPERIENCE.

Dear Editor:

In a recent issue you published without comment some letters on "First Aid Courses." It would seem to the writer that a great deal of profit and much good could be accomplished by a thoro discussion of this subject.

It is a most unfortunate condition when so many teachers are engaged to teach some subject of which they have only a meagre comprehension. The fact that such letters are written proves conclusively that there are many teachers teaching subjects of which they have comparatively no knowledge. How they expect to teach something about which they know nothing is beyond my understanding.

I do not blame the teachers so much as I do the school officials who are responsible for their engagement. Too often they are sufficiently satisfied if the teacher has a degree from some school. They seem to have the feeling that a degree guarantees that the holder of it is competent to teach anything under the sun.

The writer does not wish to underestimate the value of a degree, or cast any reflection on any man holding one; but merely to have one does not necessarily prove that the possessor of it is competent to teach any one of the many manual training branches.

Teachers with a degree are usually better able to secure a position than teachers without one. If all things were equal, this would be an ideal condition. But too often the teacher with a degree knows little or nothing about carpentry, woodworking, blacksmithing, and the other branches of manual training. And generally those without the degree are men who have majored in one of these subjects, and are thoroly familiar with all of its possibilities, but who have not had sufficient school work to entitle them to a degree. Such a condition is most unfortunate for the schools, the pupils, and the teachers.

In selecting a teacher for a certain position the emphasis should be properly placed. A teacher for Latin, English, or algebra, must have other qualifications than one for pattern-making, molding, or machine-shop work. When this is true there will be no need for these "First-Aid" letters.

The following incident will illustrate the point. There was a manual training vacancy, and various candidates appeared. Mr. A., one of the candidates, was a teacher of several years' experience, with about ten years of practical shop work. He was a high-school graduate, and had done about one year of college work. Moreover, he had credentials showing that he possessed exceptional ability for his work.

Upon meeting Mr. B., the superintendent, and after exchanging the usual formalities, Mr. B. asked Mr. A. if he were a college graduate and had a degree. Mr. A. answered in the negative, but assured him that he was amply qualified for the position. Without any further questioning or investigation Mr. B. replied, "No, we must have a man with a degree."

Were this an isolated case it might be dismissed, but unfortunately it is too prevalent. As a result we have many manual-training teachers who have degrees but who immediately upon their election, in a fit of desperation write these "First-Aid" letters. They expect to gain the necessary knowledge in a few weeks, and mostly out of books. Any one who knows anything about the industrial arts knows that this is impossible. But not so with these "unfortunates"; they will bluff it thru.

If a discussion of this subject would bring about the necessary legislation and eradicate this evil, our efforts will not be in vain.

—A CONSTANT READER.

BENDING QUARTERED OAK.

Mr. Editor:

We desire to bend some quartered oak in the shop this year and it will be our first experience. Will you kindly give us as much information as possible on the bending of wood after it has been boiled? Some of the pieces that we will bend will be for chair rockers, backs, and arms. How long will it take a $\frac{3}{4}$ -inch thickness of quartered oak to become pliable enough for bending? Will the bent pieces straighten any when removed from forms?

Clay City, Indiana —CHAS. H. DALTON.

AFTER-SCHOOL WORK.

Mr. Editor:

Is it desirable to allow pupils to work in the shop after the regular school hours? If so, must all such work be supervised by the teacher? I know that some teachers are not willing to give their time for such supervision, but I am willing; I simply want to know whether such work is desirable, and if so under what regulations. Perhaps your *Open Questions* department can help me to learn the experiences and opinions of other teachers who have had more experience than I have had.

—E. W. J.

PROPORTIONS OF MORTISE-AND-TENON JOINT.

Gentlemen:

In regard to the question concerning the mortise-and-tenon joint, I wish to say, as has already been stated in the Magazine, that its proportions are hard to determine. But there is one general rule in extensive use in Europe (given in "Required Knowledge," a book published in Austria, and containing information collected in England, Germany and Austria) which is so very simple and easily explained. This rule is: Make the tenon one-half the thickness of the stock, when the stock of both pieces to be joined is the same thickness. In the case of a table leg, for instance, where its thickness is 3" and the rail is about 1", the thickness of the tenon will depend upon the thickness of the rail rather than of the leg. If the rail is $5\frac{1}{2}$ " wide and 1" thick, the tenon might be $\frac{1}{2}$ " x $4\frac{1}{2}$ " x $2\frac{1}{2}$ ". It should be clear, however, that this rule is only a general guide, and that the workman's judgment must be exercised in determining sizes.

Akron, Ohio.

—L. SUHADOLINK.

SHOP NOTES AND PROBLEMS



THE GUNS IN USE.

DRILL GUNS.

ONE OF the interesting projects recently made in school shops is the drill gun for use in the school military activities. The drawings and photographs illustrate the working out of this project at the East Technical High School, Cleveland, Ohio, where 150 were made during the spring term last year. In the words of one of the men connected with the school, these guns are of a superior type for drilling

purposes and "will do everything but shoot a bullet."

It is evident from the drawings that this project involves a considerable variety of processes in woodworking and metalworking. A number of jigs and fixtures (shown in the small halftones) were devised, and made to facilitate the construction.

The gun designs were made under the supervision of J. G. Matthews, instructor in mechanical drawing. The photographs were sent in by



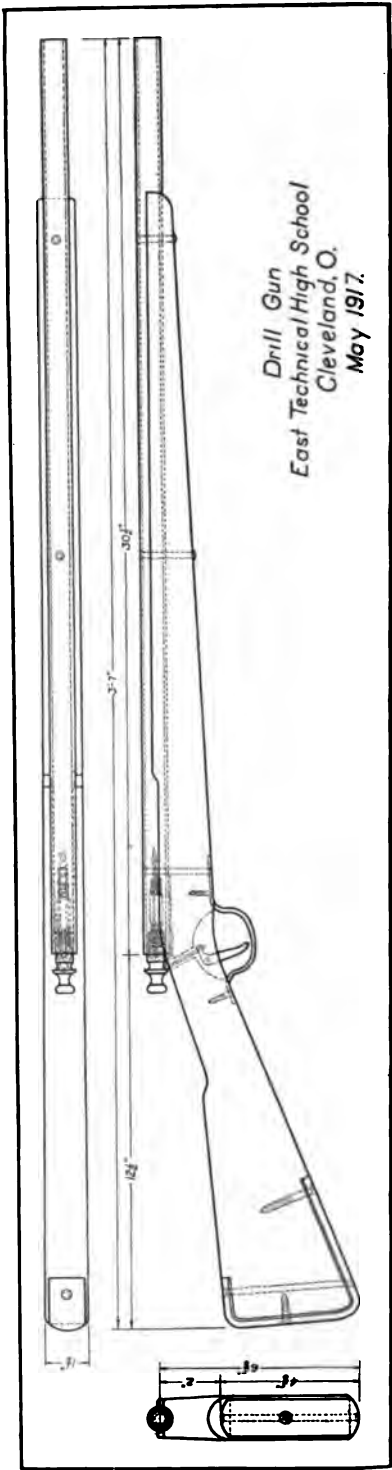
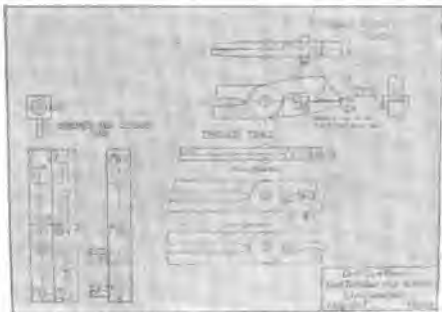
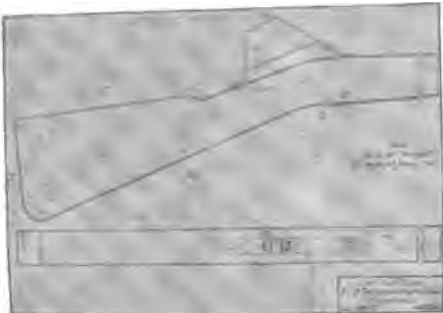
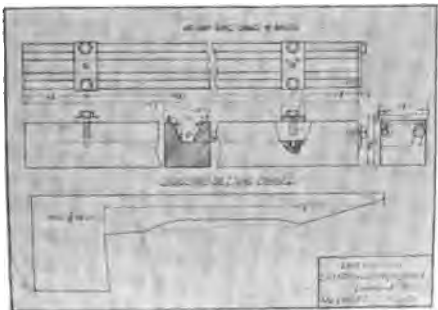
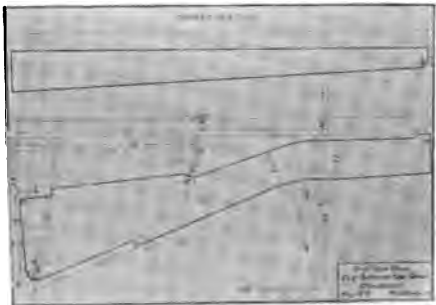
DESIGNING THE DRILL GUNS.

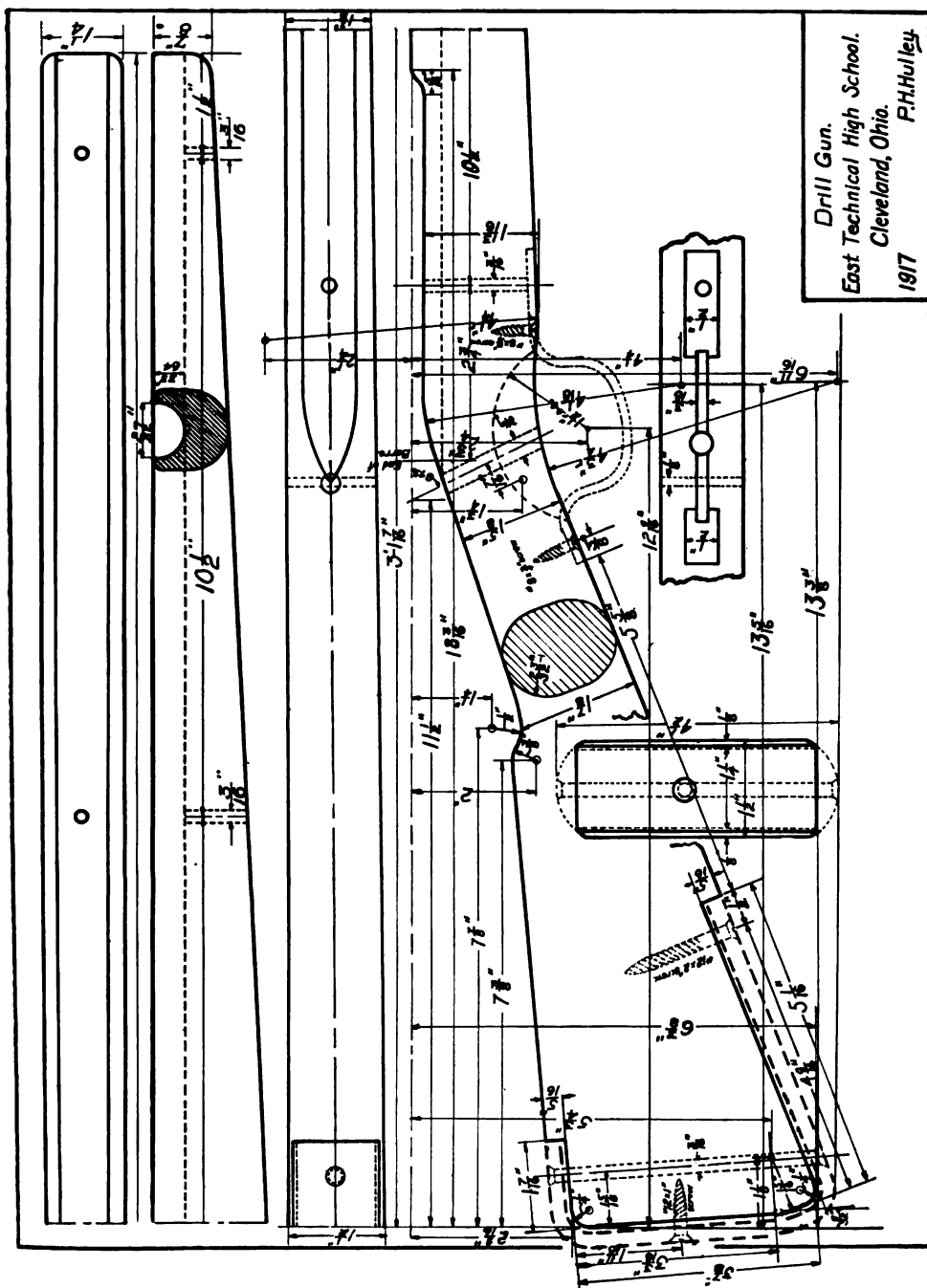


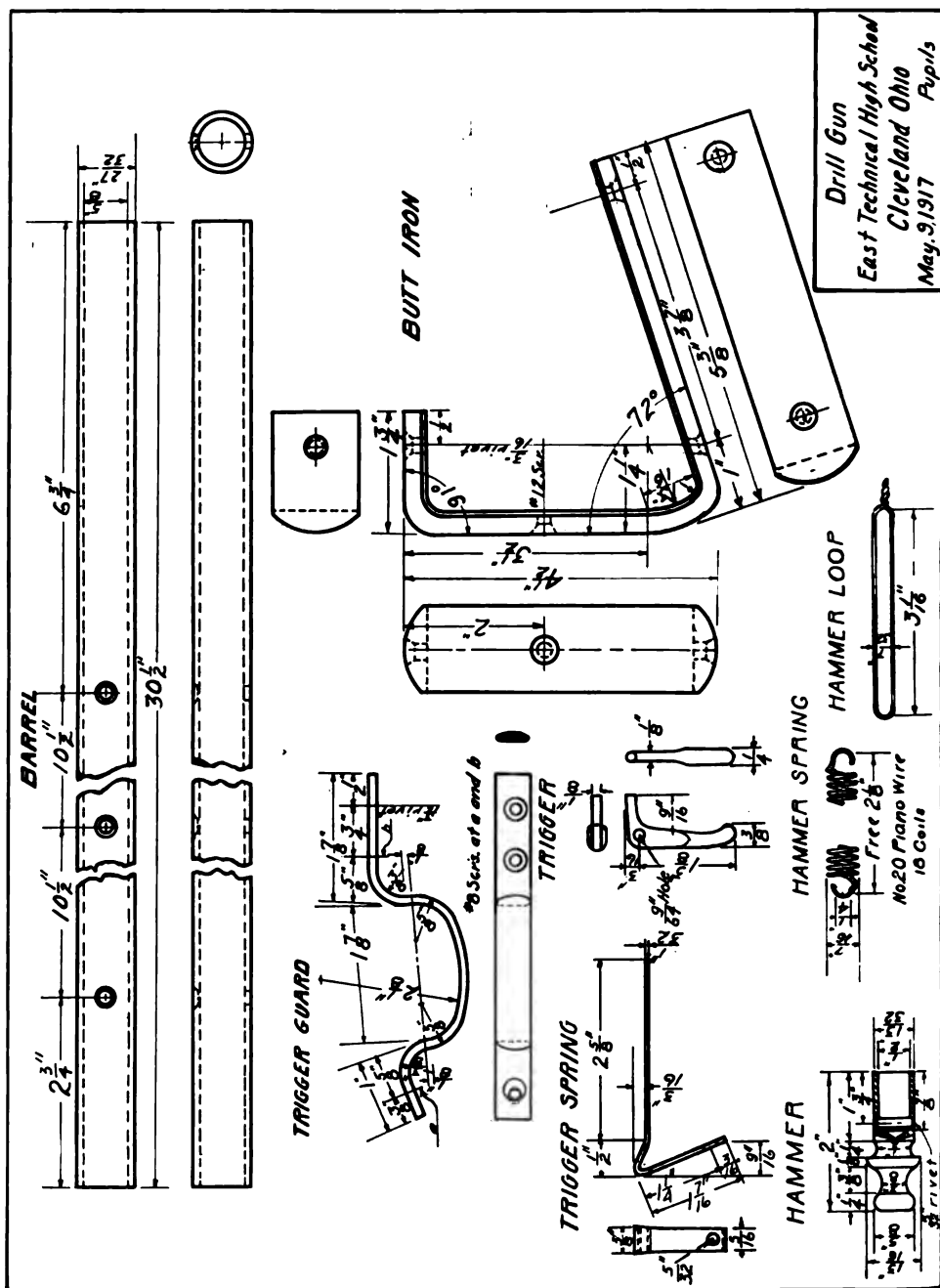
ATTACHING BUTT IRONS.



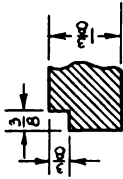
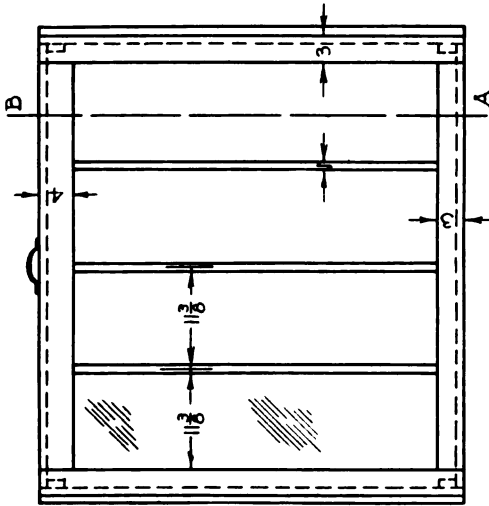
ASSEMBLING GUNS.



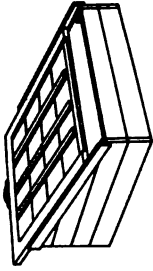




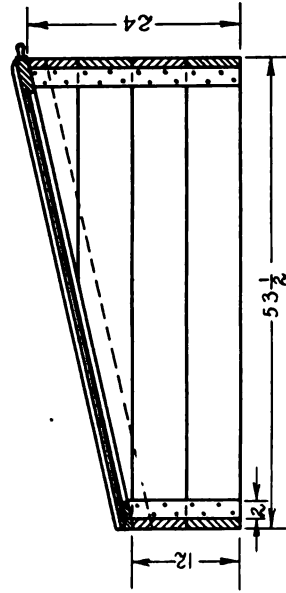
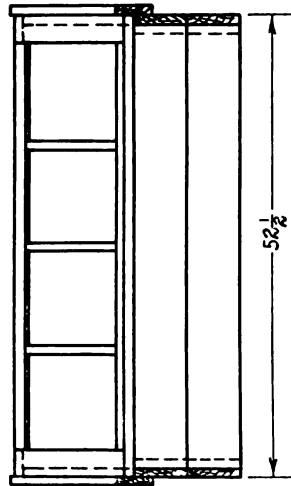
HOT-BED FRAME



RABBET IN SASH



NOTE - THIS FRAME WILL RECEIVE
A COMMON STORM SASH - 16 LT.-12"X12".
FRAME MADE OF 3/8" MATERIAL.



SECTION THRU AB

H. O. Hutchins, formerly assistant principal under whose general direction the project was undertaken. The drawings were contributed by the principal, Charles H Lake.

EXHIBITS OF TOOLS.

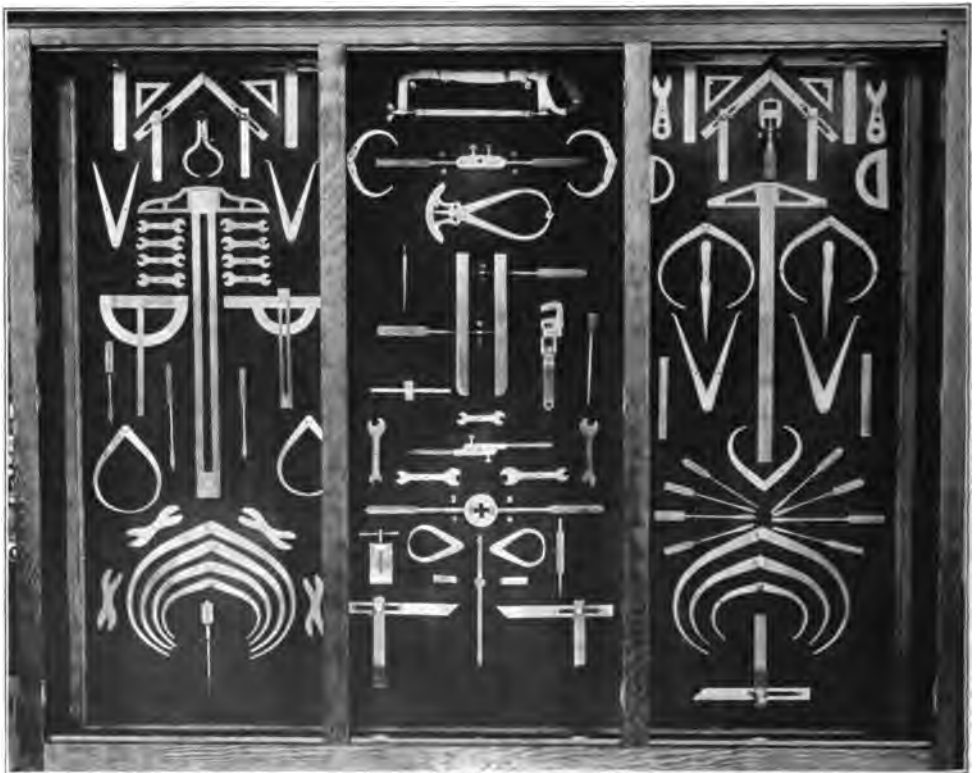
Two years ago the high-school at Auburn, Washington, installed a machine-shop and forging equipment to supplement its facilities for woodworking and mechanical drawing. This enabled the school to give a three-years' course in manual training. Woodworking and mechanical drawing were given the first two years, and machine-shop work and forging the third year. The students generally spend two 45-minute periods each day in the shopwork—ten periods a week; but a few students are permitted to double this amount of time. Most of the boys who take up the machine-shop work

expect to enter the industries upon graduation. Several are already employed in good industrial positions.

The accompanying photograph shows tools that have been made by students in the machine and forge-shop, under E. E. Bergman, instructor in manual training.

HOT BED FRAME.

This project finds a ready use during the early spring months for home gardens. While old storm sashes may be used, it is preferable to make the entire project in the shop. The lower crosspiece should be cut so as to allow the water to drain off readily. The lights are laid similar to shingles for the same reason. The drawing was made by Jonh Friese, formerly of Bonner's Ferry, Idaho, now in the Quartermasters' Department of the Army.



TOOLS MADE BY STUDENTS IN HIGH SCHOOL, AUBURN, WASHINGTON

CURRENT PUBLICATIONS

Architectural Drawing for Secondary Schools, by Ralph F. Windoes and Harvey B. Campbell. The Webb Publishing Co., St. Paul, Minn., 1917. Size, $10\frac{3}{4} \times 7\frac{7}{8}$ oblong; 149 pages, 89 figures, 32 plates, and a colored frontispiece; price, \$1.50, net.

One of the notable facts concerning the development that has taken place in manual arts courses during the past very few years is the rapidly increasing popularity of courses in architectural drawing. This is just as it should be, for nearly every secondary school graduate sooner or later comes in contact with home building or home repairing or office or factory building or repairing. He is pretty sure to be able to use what he is taught in an elementary course in architectural drawing.

Another fact is that up to the present time the development of books on this subject has not kept pace with the need for such books. It is true that books on architectural drawing have long been available, but with one or two exceptions they have not been written from the high school standpoint, and no one of them has seemed to stand out as meeting the needs in many places.

The authors of the present volume, teachers of architectural drawing in the high schools of Davenport and Kansas City, spent two years in an investigation of high school courses in architectural drawing securing data, deciding on standards of technic, determining styles of lettering, etc., before they began to make the drawings for the book or wrote a single paragraph. This book is therefore based on the best high school experience in teaching the subject it treats. No claim is made for a great amount of originality in the problems selected, but the aim has been to select such as have proven to be practical in teaching high school classes, and such as should be fundamental to any good course in the subject.

In addition to such material the authors have included chapters on the following subjects: plumbing, heating and ventilating; wall boards and metal lath; specifications and estimates; and rendering. The book also contains a valuable collection of data and miscellaneous tables. Some of these are distributed thru the text, while others are placed in a chapter by themselves.

A valuable characteristic of many of the plates is that the name of each important part of the structure is given. Another noticeable feature of the book is that the designs, for the most part, are for small and comparatively inexpensive houses. The book will be a great convenience to many teachers and will enrich the course of many a pupil.

A Roman Alphabet and How to Make It, by Frank Forrest Frederick, director of the School of Industrial Arts, Trenton, New Jersey. Published by the author, 1917. Size, 6×9 in.; 28 pages, accompanied by five plates of letters printed on heavy Manila paper which are deposited in a pocket in the paper cover; price, 75 cents.

This little book tells just how to use the letters of one alphabet, and that the most important one. Many books give information about alphabets and illustrate their use by showing historic examples, but this is the only book we have seen that gives just the practical help that a student needs. It tells just how to draw the letters; it gives short, clear statements on letter composition; it explains and illustrates in detail a direct, practical method of procedure in composing with letters of the same height cut from the sheets provided with the book; it treats of variations in size and form, and shows how to work with these variations; then it discusses lettering without making use of units of space; and finally it discusses the evolution of originality in lettering.

The practical character of this book should commend it to all who have to do with the teaching of lettering. The spirit of the book (for this book has a spirit) is admirably expressed in the first paragraph under "Composing with Letters." "The best way to do anything is to find out exactly what it is and to go ahead and do it. Too many go ahead before they know just what they are to do. This may show courage and industry, but not wisdom. This applies to the composition of letters."

Drawing and Design for Craftsmen, by R. S. Bowers, designer. Published by David McKay, Philadelphia. Size, $5\frac{1}{2} \times 8\frac{1}{2}$ in.; 407 pages, 770 illustrations; price, \$2.00.

This book is concerned with "the production of drawings for artistic purposes. The book

is of English origin. It covers a wide range of work; for example, elements of freehand drawing, geometric drawing, practical applications of geometric drawing, drawing geometric patterns, brushwork for a designer, making designs, natural forms in design, human figure in design, lettering, heraldic devices, perspective drawing, pencil sketching, sketching in pen and ink, wash drawing, water color drawing, drawing for reproduction, tracing, designing leaded glazing, mouldings, designing woodwork, wood-carving, designing for metalwork, etc. Each subject is treated in a separate chapter—46 in all. Some of the chapters would be very suggestive to almost any manual arts teacher while other chapters would be of no value at all because American standard practice is not the same as English.

The history and influences of roads together with the part that improved highways can be made to play in our national development are set forth in this volume. Methods of building roads for various purposes are described in non-technical language by an authority.

RECEIVED.

Plans for the Organization and Administration of the Smith-Hughes Act. Submitted to the Federal Board for Vocational Education by the Oregon State Board for Vocational Education. Published by J. A. Churchill, State Superintendent of Public Instruction, Salem, Oregon. This 28-page bulletin contains regulations prepared by the State Board.

Statement of Policies. Federal Board for Vocational Education, Washington, D. C. This is Bulletin No. 1, issued by the Federal Board of which Dr. C. A. Prosser is the director.

Report of the Federal Board for Vocational Education. Dr. C. A. Prosser, director, Washington, D. C. This is the first annual report of the new Federal Board. It is for the year 1917.

The Seasoning of Wood, by Harold Betts in charge of Office of Industrial Investigations United States Department of Agriculture Bulletin No. 552. This is a very interesting illustrated pamphlet on the proper methods of seasoning wood. It contains records of interesting experiments and several illustrations of value to teachers.

Report of the Committee on Vocational Guidance of the United Hebrew Charities of the City of New York, by Henry J. Eckstein, chairman. Published at 1637 Washington Avenue, The Bronx, New York City.

How to Vitalize the Teaching of Agriculture in the Rural Schools. A pamphlet issued by the Agricultural Extension Department of the International Harvester Company. P. G. Holden, director, Harvester Building, Chicago.

Dunwoody Institute Evening Classes, 1917-18. This is an illustrated announcement of the large number of courses of study offered at Dunwoody Institute, Minneapolis. Any director of evening school classes will find this announcement very interesting.

Report of the Work of the Bureau of Education for the Natives of Alaska, 1915-16. Bulletin No. 32, 1917, issued by the United States Bureau of Education, Washington, D. C.

Bulletin of the Western Drawing and Manual Training Association. Louis R. Abbott, secretary, Grand Rapids, Michigan. This Bulletin contains the proceedings of the meeting held May 2-5, 1917, at Lincoln, Nebraska.

Report of the First Convention of the Eastern District, International Association of Teachers of Printing. R. A. Loomis, secretary, William Dickinson High School, Jersey City, New Jersey. This is the report of the meeting held at Hotel McAlpin, New York City, April 16, 17, and 18.

An Address to the Graduating Class of the School for Apprentices of the Lakeside Press, Chicago, Illinois, by Professor Rollin D. Salisbury, of the University of Chicago. Designed and printed by the apprentices of the Lakeside Press.

Garden Clubs in the Schools of Englewood, New Jersey, by Charles O. Smith. Bulletin No. 26, 1917, issued by the United States Bureau of Education, Washington, D. C.

Studies in Higher Education in England and Scotland with Suggestions for Universities and Colleges in the United States, by George E. Maclean, formerly president of the University of Iowa. Bulletin No. 16, 1917, issued by the United States Bureau of Education, Washington, D. C.

MANUAL TRAINING MAGAZINE

MARCH, 1918

CO-OPERATIVE COURSES

A. BENTON GREENBERG.

Co-ordinator of Architectural and Engineering Drawing, Stuyvesant High School, New York City.

IN 1914, as a result of a visit by Mayor Mitchell, President Churchill, of the Board of Education, and other school and city officials, Dean Schneider, of Cincinnati, was invited to work out a plan of co-operative schooling for the high schools of the City of New York. The idea of trying this experiment upon immature high school students was at first ridiculed. The plan, furthermore, was not thought feasible for a city like New York, with its enormous cosmopolitan population and its apparent absorption in material interests. There were a few men, however, who had the breadth of vision to discern the tremendous possibilities in the scheme. They realized the broad foundation of fact and practical experience it would give to the theoretical superstructure our schools were trying to build.

One of these men was Dr. Ernest R. Von Nardroff, principal of Stuyvesant High School. As the head of a manual training high school which has one of the finest mechanical equipments in the country, Dr. Von Nardroff had the opportunity of putting to test some of the ideas and suggestions of Dean Schneider, particularly those that were of a technical character.

Accordingly, after considerable negotiations, a mutually agreeable working basis was established between some of the tech-

nical departments in the school and the corresponding departments in the city service, and in the offices and laboratories of private concerns. Co-operative courses were given in the following subjects: surveying, power plant practice, electrical wiring, chemistry, structural engineering, and architectural drafting.

In the co-operative plan of vocational education, the students work in pairs. While one is at the office, shop, or laboratory, the other is at school. They change places every week. Thus a student works in the office one week and in the school one week, alternately. Every Saturday the students meet, compare notes and plan for the next week's work and study.

The co-operative courses are open only to those students in graduating classes who have a high scholastic standing and who show or give evidence of marked ability in the particular subject chosen. Instead of spending their last year at school, these students are given an opportunity of obtaining valuable experience in the trade or profession they intend to make their life calling.

These courses are properly called "co-operative" because they enlist the active co-operation of the outside practical world in directing some of the educational policies of the school. The alert business man, the wide-awake engineer, and the efficient

chemist, give to the school the benefit of their wide experience and broad training. They help shape the courses of study by casting them in practical moulds.

To gain a clearer insight into the operation of the co-operative courses let us observe the student at work in school and in the office: At school the co-operative student is given a special program of studies, a special set of teachers, and is assigned to a special class. He covers the same ground of the regular academic student but he approaches all subjects from an entirely different angle. In one case, history for instance, is presented from a purely academic standpoint, while in the case of the co-operative student, the fact that he is preparing for his life work and for immediate contact with the outside world, determines in a great measure the practical character of the subject-matter. The course in history is divided into two parts: (1) The history and civics of the United States, showing little difference from the regular course of the academic student; and (2) economics. Here we find a distinct change. After studying the general theories of production, distribution and consumption, specific problems, closely associated with the work of the different co-operative students, are presented. To illustrate: Under "labor" there is a problem entitled "factory construction." After discussing the various methods of lighting, heating, and ventilating factories, the probable causes of fires are taken up for discussion. Defects due to lighting, such as faulty installation; defects due to heating, such as poorly insulated pipes; and defects due to ill-ventilated shafts, are in turn inquired into by teacher as well as student. How to prevent fires, is the next topic that comes up for discussion. The co-operative student in architecture speaks of mill construction and fireproof buildings. The student in power

plant work discourses on automatic hose sprinklers and thermostats. The student in chemistry talks of pyrene and other fire extinguishers. Later on, the following pertinent topics are considered: Child labor, workingman's compensation act, trade agreements, arbitration, strikes, boycott, and factory laws.

In the case of mathematics the same diversity of content obtains. While to the academic student mathematics is considered a subject to cultivate his reasoning powers, to the co-operative student it means direct application to his daily work. The student in architecture, for example, is taught how to estimate woodwork, stonework, etc.; how to use the slide rule in computation; how to find lengths and distances by means of trigonometric functions and logarithms; and finally, how to determine, graphically, stresses in trusses.

Similarly with English. To cultivate ease and grace of expression, the co-operative student is required to discuss orally topics of the day. His written English consists of reports on work done in the office; business forms; business letters; and essays on topics germane to the subject in which he is specializing. Thus the architectural student is asked to discuss "The Architect vs. the Engineer"; "Originality in Architectural Expression," "Characteristics of Gothic Architecture," and the like.

So much for the work of the "co-op" at school. To follow him in his work in the office, we will take the typical case of the architectural student who was assigned to the drafting-rooms of the Public Service Commission, and trace his metamorphosis from an academic student to a finished draftsman.

One week in the drafting-rooms of the Public Service Commission convinced our student of his colossal ignorance of things architectural. When he returned

to school the following week he reported to his instructor the criticisms the chief draftsman had made of his work. He was particularly poor in lettering. During the week he was in school; that is, during the two periods of forty-five minutes each per day that he devoted to drawing, he was drilled in lettering. When he returned to work the next week his improvement was immediately noticed by his superiors and favorably commented upon. At another time he was asked to make studies of color schemes for name tablets to be set up in some of the new subway stations. The student notified his instructor by letter of the new work assigned to him. The instructor accordingly set the boys at school to work making tile designs and preparing color schemes. When these boys reported at the office the following week, they were fully prepared to successfully complete, and in fact greatly improve the unfinished designs of their fellow classmates.

This then is the general plan of attack. The student after spending one week in the drafting-room, returns to school the next week to receive instruction in those subjects in which he finds himself, or has been found to be, deficient. After his weaknesses are strengthened and his meagre knowledge of new subjects are reinforced, he goes back to work the following week with greater confidence in himself, and therefore with greater success in his efforts.

So thoro was the practical training our students had received in the offices of the Commission, and so efficiently did their studies at school dovetail into their work at the office that when these young men graduated they had no difficulty in obtaining positions as experienced draftsman at salaries averaging fifteen dollars a week.

The success of the experiment encouraged the instructor, who had charge

of the co-operative course in architecture, to greater efforts in extending the scope of the course. Accordingly, he made a canvass of the architectural offices and succeeded in placing four students with two private concerns.

The training the young men received in these private concerns was of a different character from that which they would have received in the drafting-rooms of a city or state department. In the first place, they worked on a variety of buildings, from garages to office buildings. In the second place, they gained an intimate knowledge of the workings of several city departments—building, fire, etc.—which are directly concerned in the construction of a building. They also learned how to file plans, remove violations, and obtain permits. They acquired skill in drawing plans quickly, accurately, and economically. In short, they gained practical and invaluable experience in office procedure and drafting technic.

At school the work of these students was supplemented by an intensive study of the building code and the tenement house law. The practice of assisting the young man to meet difficult and unknown problems as they occurred in his work was of course continued. But here again the work was of a more diversified character. Plumbing sections, framing plans, boring plans, detailing windows, doors, fireplaces, etc., were some of the problems that arose to baffle the student in the office, and which were overcome in the classroom.

Up to this point we have considered the question of co-operation solely from the standpoint of the student or the school. But what is the attitude of the architect, engineer or chemist who gives these boys the opportunity of acquiring that practical experience which is so valuable to the student when he graduates? To these employers is it a question of business or

of philanthropy? Do they employ our boys because it is of an economic advantage to do so, or because they are public spirited citizens anxious and willing to assist in any movement that tends to the uplift of their respective professions, and incidentally benefit the public? The answer to these queries will be found in the letters following, which are two of many such received:

MANN & MACNEILLE, ARCHITECTS
70 East 45th Street, New York.

May 8, 1917.

Dr. Ernest R. Von Nardroff,
Principal, Stuyvesant High School,
New York City.

Dear Sir:

I have been very much interested in the educational experiment you are trying to carry out in having the young men in your school get practical experience in architects' offices.

The two who have been alternating in this office, have been most satisfactory, and show the result of most intelligent training. The fact is they have been so satisfactory that I am writing to ask if you can let us have two more of your students under the same conditions.

We are at present designing several industrial villages, and the work in connection with these small houses is of such a nature that the young men can do it very satisfactorily for us, and I am sure the training they get is most helpful to them.

I want to take this opportunity to congratulate you on the work your school is doing in the line of vocational training.

Very sincerely,

(Signed) HORACE B. MANN.

SCHWARTZ & GROSS, ARCHITECTS
347 Fifth Avenue, New York

February 28, 1917

Dear Sir:

We beg to say that the boys placed with us rendered very satisfactory service and we were pleased to increase their salaries after they were with us a short time.

Their preparatory work appeared to be above the average of the beginners or junior draftsmen, and in our opinion the scheme of co-operation is most satisfactory and should be continued, as it enables us to secure boys of proper education with training and inclinations toward architecture.

Yours very truly,

(Signed) SCHWARTZ & GROSS.

After three years of experimentation the co-operative plan has demonstrated its practicability. Its success may be gaged from the ever-increasing number of students who are admitted to these courses. At present there are over five hundred high school boys and girls engaged in this study-and-work plan. They are scattered thruout the city in business houses, industrial concerns, drafting offices and manufacturing establishments.

All the employers are enthusiastic in their support of the co-operative plan. They hail the movement as epochal in its far-reaching effects. The intensely practical character of the instruction appeals to them.

Now that these employers are taking a real and active interest in education, they are beginning to appreciate the high state of efficiency of our educational system. The masterly manner in which such men as Dr. Ettinger and the late Associate Superintendent, Dr. Haaren, organized and directed the co-operative courses, the ease with which they secured experts in every line of endeavor from their own teaching corps, was quite a revelation to these staid businessmen.

Our school system is alive to the needs of the times. It may be depended upon for its whole-hearted co-operation in any attempt that tends toward more effective social service.

"Education is not the strolling here and there of multitudes of stragglers, but the orderly advance of great armies to a known objective. In our theory of studies, as well as life, we shall have to abandon once for all the captivating notion that the student in school or college should study what he likes, when he likes, as he likes, if he likes."

—ANDREW F. WEST

HAND CANING: THE "SPIDER-WEB" WEAVE.

L. DAY PERRY.

Supervisor of Manual Training, Joliet, Illinois.

CANE and similar materials are coming into use in woodworking shops because they are being recognized as essentials in well systematized courses in woodwork. The principal bar to their

ability to a variety of forms of woodwork. Hand caning is as well adapted to work in the grades as in the high and vocational schools. Any instructor who has had experience with cane, rush, fiber, and

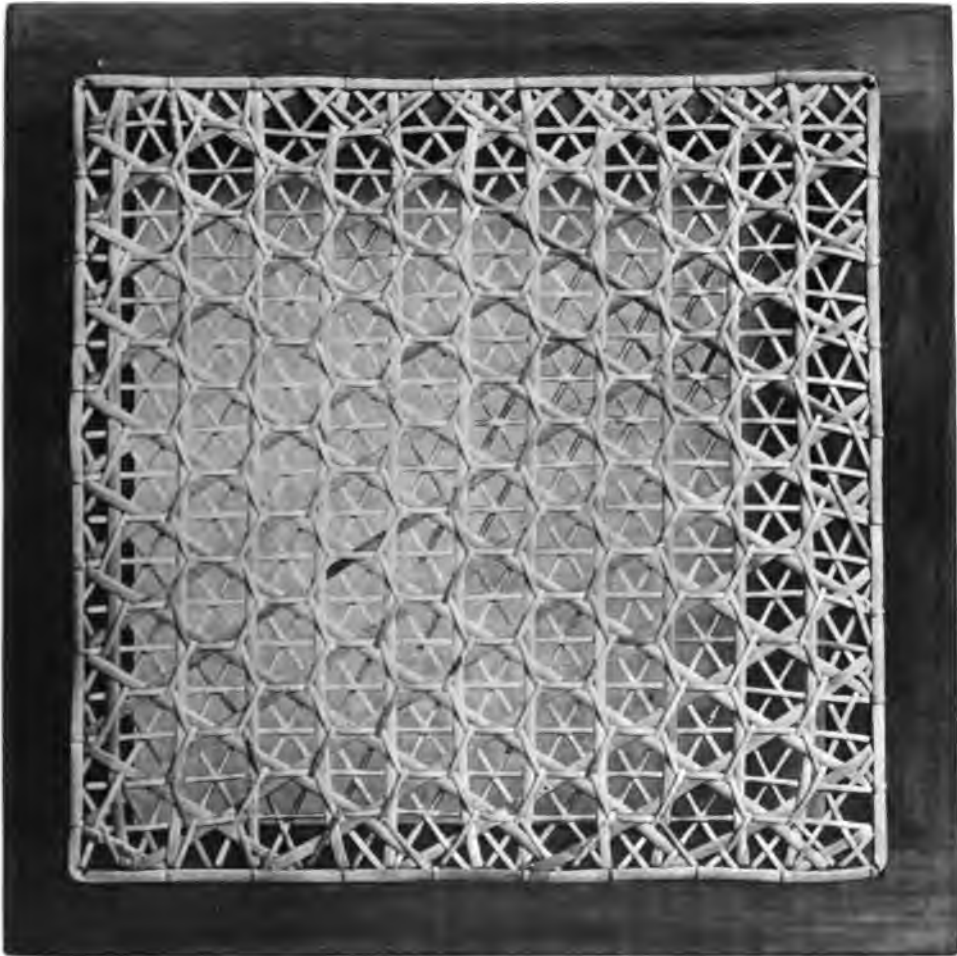


FIG. A.

introduction has been the fact that instructors were not conversant with the weaving details, altho they have recognized their application and their adapt-

other materials, involving the weaving processes, in correlation with wood, recognizes their merit and their truly educational aspects.

In discussing the "spider-web" design in cane weaving it is assumed that the person who may wish to work out the weave is conversant with the standard cane-weaving processes. He then understands how to manipulate the canes to prevent twists; how to tie loose ends; how to properly weave the edges; and the numerous details incident to the processes of weaving of such character. This weave is too difficult for the novice. He needs a previous experience in five-step or seven-step, caning. To undertake this weave without previous experience would mean ultimate discouragement. With such a foundation, however, he may undertake to work out the web design without temerity.* The design is rather intricate, yet the processes are definite and distinct. It is very pleasing and adapted to work in school shops generally.

The "spider-web" weave may be worked out in an order similar to that of the standard cane weaving. In the standard weave we have termed it "seven-step caning," because of the very definite seven processes involved in its pattern. In the design under consideration the term series will be designated to indicate the processes. There are seven series including the binder. The figure number in each case is also the series number.

Series 1. Fig. 1 shows clearly the start of the canes and indicates the holes which the canes enter. The method of manipulating the canes will not be discussed in this article. The holes shown are one-half inch apart, three-sixteenths

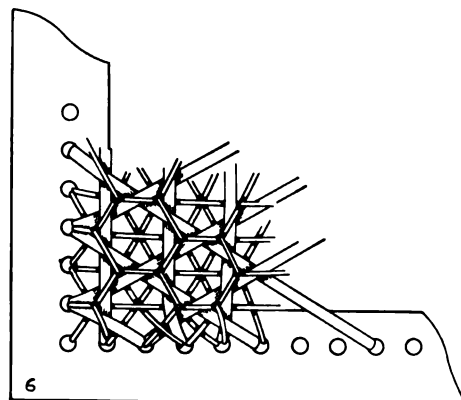
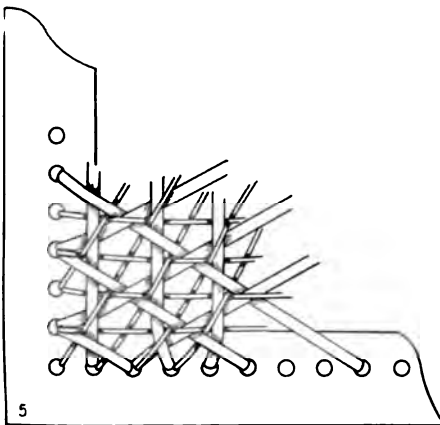
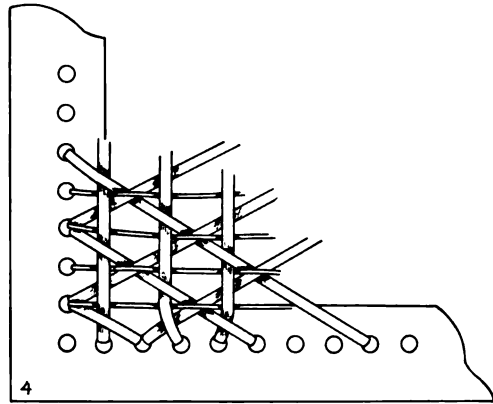
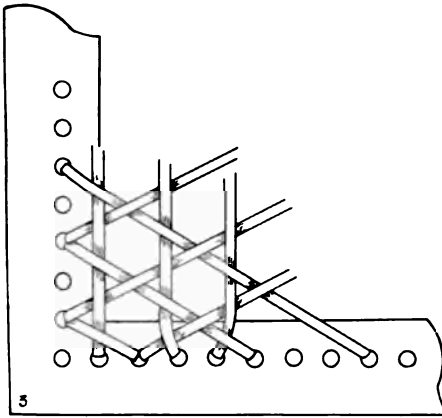
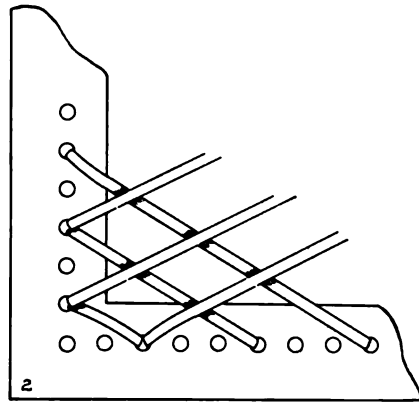
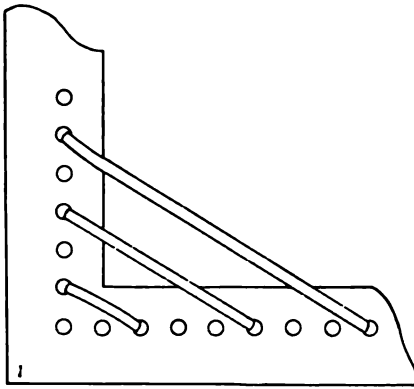
inch in diameter, and one-half inch from the inner edges of the frame. The cane used in this series is medium size. Emphasis must be made here that in this and the next series the canes cannot run at right angles to each other, but must make such an angle with the rails and with each other as to form true diamond-shaped areas. The canes of each series run parallel to each other. While this is not always practically possible, it is a rule, and any great divergence from a parallel indicates that an error has been made.

Series 2. In this series the canes are laid over those of the first series and produce the same angle with the rails as do the canes of the first series. The diamond-shaped areas are here clearly indicated in Fig. 2. In this instance the canes enter the same holes as those shown in Fig. 1, yet this condition does not hold good on all shapes, or where hole spacings vary, consequently it is a coincidence and not to be accepted as a rule of procedure. A medium-size cane is utilized in this series.

Series 3. In Fig. 3 the actual weaving process begins and continues thru all the succeeding series. It is not possible to run these canes straight into the holes always; they must veer from a straight line to enter that hole which makes their course as straight as possible. This may be accepted as a rule for all series. The canes in this series are woven *under* the first series of canes and *over* the second series. The drawing shows this clearly, and indicates the small triangular areas left by the process. Also the diamond-shaped areas are reformed into hexagonal ones. A medium-size cane is employed as previously.

Series 4. In this series is begun the weaving which produces the fine strands of the "spider-web." A carriage cane is

*Those who may wish to work out this design in cane weaving will find the data to which the writer refers in the *February, 1916*, issue of *Manual Training and Vocational Education*, and in his book, *Seat Weaving*, published by The Manual Arts Press—The Editors.



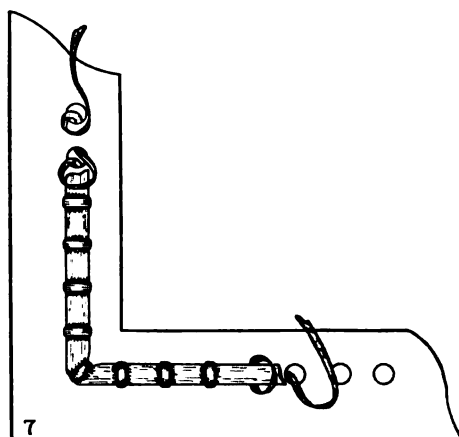
the size used here and in the next two steps. Fig. 4 shows the method of weaving the canes. They cross *over* the intersections of canes of Series 1 and 2 and *under* those of Series 3. These canes will generally enter each hole in succession as indicated in the sketch.

Series 5. The canes of this series shown in Fig. 5 cross *over* the intersections of canes of Series 2 and 3, and also *over* the canes of Series 4 at the triangle and *under* at the center of the hexagonal areas. These facts hold true in the succeeding series—over the canes in the triangular areas and under those of the hexagonal areas. Note that the canes swerve slightly to enter the proper holes.

Series 6. Fig. 6 shows how to weave the canes. They run *over* the intersections of canes in Series 1 and 3, *over* the canes at the triangular areas of Series 4 and 5, and *under* those in the hexagonal areas. A close study of the drawings will give to the worker a clearer idea of the processes than an elaborated discussion could possibly give. Therefore reference is particularly made to the drawings for details. Such statements as have been given will serve as guides and checks. Errors are readily made in Series 4, 5, and 6, unless caution is exercised at every step. The final test of a well-caned area—granting that the main area is mechanically correct—is the appearance of the edges of the area. An expert's job will show careful, neat work at the edges, while that of the average amateur indicates a certain avoidable carelessness. One of the inviolable rules of all cane weavers should be this: If a cane be woven in incorrectly, and the worker is aware of the fact, that cane should be taken out and another woven in correctly.

Series 7. As a matter of fact this series should not be considered one of the processes in weaving the "spider-web" de-

sign, for it is common to all forms of hand caning. In this design, however, the binder is necessary to give a finished appearance to the work because of certain peculiarities of the weave. Fig. 7 shows how to hold the binder. Binding cane comes in three sizes, a narrow binder, a medium binder, and a wide binder. For holes over three-sixteenth inch in diameter



a wide binder is necessary to cover the holes. The finer cane which holds the binding cane must be pulled rather taut to assure a neat, serviceable job. If the particular frame over which the caning has been done is exposed to view the canes in the rear may be covered with a thin wood strip in which a shallow groove has been run. Otherwise the cane ends may be bound and tied in the usual manner.

In working out a coarse mesh in this design a coarser cane may be used or not, at the option of the worker. A hexagonal area, three-fourths inch over all, produced by medium and carriage canes gives a mesh standard in fineness.

Fig. A shows an area woven by an amateur. The binder is held at every other hole, a procedure very proper where holes are one-half inch apart or closer. A close study of this area will disclose certain inconsequential errors. Extended

experience with the weave will eliminate similar mistakes and produce as nearly a perfect work as is possible over wood structures.

This weave is particularly adapted to reed, willow, and cane furniture. On such structures the holes may be made between canes and reeds the proper distances apart at will of the worker. It is then always possible to run canes straight and true, securing well woven edges. This is not always possible on wood struc-

tures where holes must be bored at given intervals.

The "spider-web" weave is particularly decorative; it is as serviceable as the standard weave, and is well adapted to furniture of rather light general lines. The weave is more difficult than the standard one, but because of its unusual pleasing design, is well worth the patience and time the worker must necessarily give to its production.



DAIRY BARN BUILT BY STUDENTS OF FORT HAYS NORMAL SCHOOL.

FARM CARPENTRY IN SCHOOL MADE PRACTICAL.

ED. DAVIS.

Instructor in Carpentry at the Fort Hays, Kansas, Normal School, Hays City, Kansas.

AS A charge is often made that nothing practical is taught in our high schools and colleges in woodworking departments, the accompanying photograph serves as an argument against this somewhat popular notion.

The class in farm carpentry of the Fort Hays Kansas Normal School, built this dairy barn during the summer of 1917. The buildings were planned by

W. A. Lewis, president of the institution. This western college tries to meet the needs of western Kansas by giving its students actual experience in architectural and agricultural problems. It is doing extensive project work along several lines, one of which is dairying. This project is purely a student enterprise. Each student belonging to the Dairy Association is allowed to keep three cows which he takes

care of, and from which he receives all the profits, to help him in getting his education. To meet the demand for this work the state constructed a fully equipped dairy, well lighted and sanitary in every respect.

The main barn is 34x100 ft. It has stalls for 42 cows and two box stalls. One main feature of the barn is the absence of the deep gutters found in most barns. The stalls are so arranged that the cows eat their hay from a rack and the grain from a trough placed high enough above the floor so that when the animals lie down their heads are under the manger. At the back of the stall is a piece of 4x4 ripped cornerwise and laid flat on the cement floor. This is fastened by large screws and prevents the bedding from working back into the wide shallow gutter. When the cow is standing her hind feet are back of this triangular shaped piece of 4x4, and when lying down she is entirely in front of it, keeping the bedding clean at all times.

The creamery is a two story building 20x42 ft. The first floor is divided into a milk-room 16x20 ft., a butter-room 20x20 ft., and a boiler-room 6x9 ft. A large cement cave is easily accessible to the two laboratories. It is 12x20 ft. and 7 ft. high. In one end is a rack which will hold a ton of ice. Below the ice rack is a tank which catches the water and in this are kept the dairy products. The second floor of the creamery is fitted up for a dormitory to accommodate six boys who work in the dairy and the barn.

The grain and feed barn which is to be built during the fall semester by the carpentry class, is to be 24x42 ft. It will have a number of separate grain bins on the first floor and a loft above for bailed hay. When this project is complete it will have besides these buildings two silos 16x50 ft., one on each side of the main

barn. Covered entrances connect the silo and grain barn on one side, and the creamery and silo on the other side. All the cement work, except the silos, was done by members of the class. The completed silo has been filled with fodder which was grown on the Normal's farm land by the students.

It may be of interest to some readers to know how the classes were organized and what credit was given. The rating of college subjects is based upon the standard that a subject requiring outside preparation of eight hours a week and reciting four 55-minute periods per week for one semester gives four hours credit. Thirty-two hours constitute a year's work. The students of college rank in the Woodworking Department are required to do twelve hours work per week for the four hours credit, and the pupils of high school rank receive half a unit for eight hours work per week. This time is given to lectures and drawing, as the instructor may determine.

The work on the barn was begun during the summer term. The students enrolled in the carpentry classes were so organized that the instructor could remain on the job and have students working under his direction during the entire day. Students were given the privilege of working more than the required time each week, for which they received extra credit. The buildings were not completed during the summer term, so some of the boys who cared to work after the term was over were paid 25 cts. per hour and given credit. This plan not only gave them more credit, but provided a means to earn some money with which to continue their school work in the fall.

This project work will mean much to western Kansas and will do much to develop the possibilities of the "short grass" country.

HOW I STARTED MY GRAMMAR GRADE BOYS THIS YEAR.

This is the third article in the series on methods of teaching woodworking and drawing in the grammar grades. It will be followed by others.

A CLASS of twenty (20) seventh-grade boys reported at the manual training shop promptly at 9:00 o'clock in the morning. It was a real "dyed-in-the-wool" shop, yet it more nearly resembled a drafting-room, for all bench-tools and

piece of wood 6"x6"x $\frac{5}{8}$ ", in which various sized holes were to be bored, a model of which was exhibited to the class for their examination.

A, not to exceed, 20-minute talk on the problem before them, the value of work-

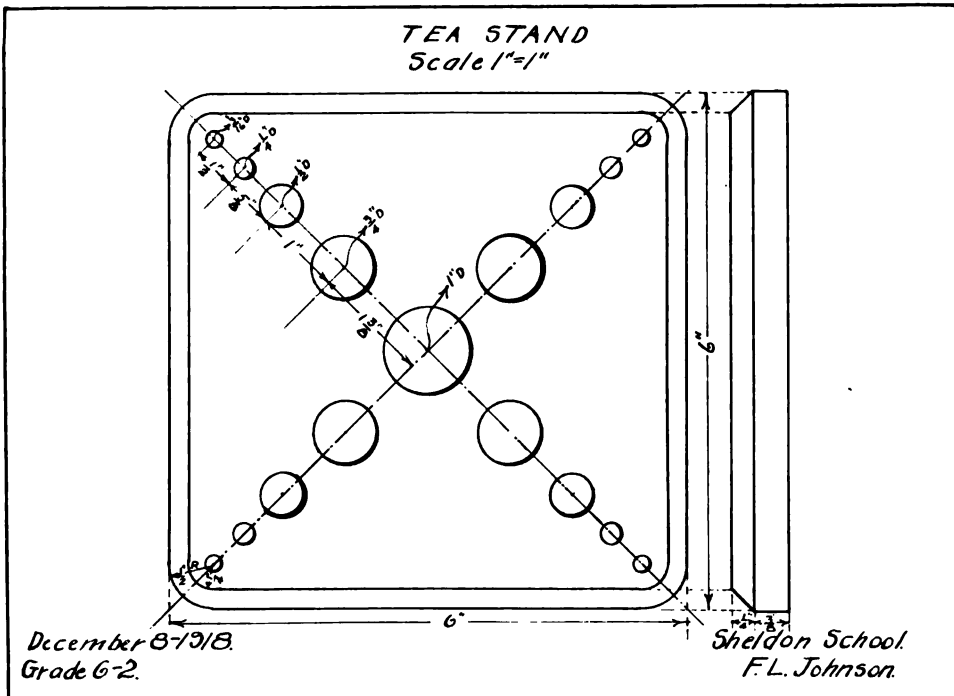


FIG. 1.

woodworking equipment had been carefully put out of sight and their places taken by displays of "A" drawings executed by the previous classes.

On the blackboard, recently washed, was (1) an outline of the required work of the semester, together with the time to be allowed for the completion of each exercise, and (2) a complete two-view working drawing of the lesson for this class, viz.: A tea stand, a rectangular

ing drawings, and suggestions of the problems that would arise in making this piece, was then given.

The making of a full-sized, two-view, working drawing of the tea stand, Fig. 1, was the initial lesson, while the selection of the wood, the "Five Fundamental Steps for Reducing Stock to Dimensions," Fig. 2, and new tools to be used later on in the making of this piece, were spoken of. The drawing was the lesson of the day.

A short, snappy re-statement was made of the proper use of the already used drafting tools, the various kinds of lines used and a demonstration at the bench of the new drafting tool, the compass.

Also, these points were brought out: All drawings must be identical in size; all lettering the same in size, style, and position on the drawing (printed lettering sheet was furnished each boy); pencils and arrow heads must be sharp, and rulers must be held on edge to secure the required accuracy of measurement.

Loud talking was conceded as undesirable, and was voted "tabooed." "Near enough" and "pretty close" could not be accepted as adequate excuses for inaccuracies.

Five foremen were appointed by the instructor, each to correct and check the work of the four boys nearest him. Each drawing must be passed upon by the foreman before being brought to the instructor for the final ok. Each drawing was marked and numbered in order of completion, and later on, stock was to be cut out in this order.

This working drawing was to be a full-sized, two-view drawing, dimensioned and drawn as shown on the blackboard. It must be completed and ok'd by the instructor in this one lesson of 135 minutes.

By 9:20 every boy had his entire drawing equipment on his bench ready to take the initial steps in the drawing of this tea stand.

BOARD OF EDUCATION MANUAL TRAINING DEPARTMENT
GRAND RAPIDS, MICHIGAN GRADES

BENCHWORK

Directions For Bringing Stock To Finished Dimensions

1. OBTAIN WORKING FACE:

Plane best face true and mark it thus: // This surface is now called the WORKING FACE or MARKED FACE.

2. OBTAIN WORKING EDGE:

Plane best edgesquare with WORKING FACE and mark thus: / This surface is now called the WORKING EDGE or MARKED EDGE.

3. OBTAIN WIDTH REQUIRED:

Set gauge to finished width and gauge a line on both faces. Plane edge down to gauged lines square with WORKING FACE.

4. OBTAIN THICKNESS REQUIRED:

Set gauge to finished thickness and gauge a line on both edges. Plane face down to gauged lines square with the WORKING EDGE.

5. OBTAIN LENGTH REQUIRED:

Square a line around the stock with knife and try-square one-quarter of an inch ($\frac{1}{4}$ ") from on end and cut square with back saw. Lay off from this end finished length and square up as for first end.

FIG. 2.

The drawing was laid out on the paper from dictation. Lettering was put in from reference to the "A" drawings hanging on the shop walls.

— *ABCDEFGHIJKLMNOPQRSTUVWXYZ*

abcdefghijklmnopqrstuvwxyz 123456789

Capitals $\frac{3}{16}$ " high, Small letters $\frac{1}{8}$ ", Slant 60°.

Always draw 3 lines to limit the height of letters. If smaller letters are preferred, make capitals $\frac{1}{4}$ ", small letters $\frac{3}{32}$ ".

HANGER 60°

Board of Education
Grand Rapids, Mich.

Stock 60°

Manual Training Department.

FIG. 3. LETTERING SHEET FURNISHED EACH PUPIL.

The space required for the two views and the balancing of the drawing on the paper was taken up by the class, and the outline of the top view drawn. Then the one-fourth inch bevel line, the diagonal center lines, and the circles followed. The edge or side view was projected across to the right of the top view. Dimensioning came last.

Cleaning up with eraser preceded the check by the foreman and final ok by the instructor.

—F. L. JOHNSON,
Grand Rapids, Michigan.

THE fact that so many of our boys leave school at the end of the eighth grade has concerned me to such an extent that this year we are working on a plan that is different from that used in previous years.

The plan that we have tried for nearly a semester has proved to be a winner, and we are satisfied more is being accomplished than ever before. It is as follows:—

1. Our aim is to teach our regular eighth-grade course, outlined for the city at large by the Manual Training Department, which covers (a) joinery and includes (b) a course in the construction of the common joints such as the dowel, mortise-and-tenon and others, (c) a study of the different hard woods, (d) the action of cold and hot glue, (e) the making and reading of simple working drawings and (f) the use of woodworking machines, and devotes to this work $1\frac{1}{2}$ hours per week for one semester.

These same pupils may elect work in mechanical drawing including the making of tracings and blueprints; two double periods (3 hrs.) each week under the same instructor.

The outline for this work is very simple and still so different from the elementary mechanical drawing course generally

outlined for beginners that I will briefly outline it:—

1st. We never draw anything without having the model before us.

2nd. We talk over the number of views necessary to show the construction, and obtain all needed dimensions.

3rd. We then discuss the placing of the different views on the paper, and the scale which should be used.

Every boy is then left to work out the drawing to the best of his ability. Where I discover some one needs assistance, a suggestion may be given now and then. Thus far we have drawn a shoe box, taboret, sewing cabinet and a small table. We now have one month left for inking, tracing and blueprinting.

Before inking, every boy makes a practice plate consisting of horizontal, vertical, dotted, dot-and-dash, dimension lines and circles. This is repeated if necessary and then the boy is ready to ink in any of his previous drawings, trace and blueprint them.

We use the old style of blueprinting, the frame and sunshine, because if these same boys ever wish to blueprint after leaving school, this is undoubtedly the method they will use. These boys after making their first blueprints will always remember the method. If they continue in high school, they use electricity.

Another interesting experiment is in teaching English in the shop. For instance when an instructor asks for a written lesson on Michigan white pine, about one half of the class will fail to have anything, and the others very little. This is the remedy: Ask the English teacher to have these boys write a composition on Michigan white pine for their English lesson, and you will not be disappointed, for every boy feels in duty bound to get his English and unconsciously he is serving your purpose to perfection.

Our English teacher reports that the interest in these lessons is splendid, as they deal with something that is a real, live issue to the boy, and urges me to make frequent use of her department. This shows the value of cooperation.

The result of this work has convinced

us that if more time is given for this kind of eighth grade shopwork, we can do more for the boy than any other department of the school system.

—LOUIS H. GUNTHER,
Union High School,
Grand Rapids, Mich.

THE 1918 CONVENTION OF THE VOCATIONAL EDUCATION ASSOCIATION OF THE MIDDLE WEST

CHARLES A. BENNETT.

THE fourth annual convention of the Vocational Education Association of the Middle West was essentially a patriotic meeting. From beginning to end the atmosphere was tense with interest in the problems of education made vital by the present military conflict with Germany. All of the memorable addresses of the convention were inspired by the great war and what must follow it in America.

The convention was held at the Morrison Hotel, Chicago, on the 24th, 25th and 26th of January. All present agreed that this hotel furnished ideal accommodations for such a meeting. The principal sessions were held in the banquet hall, the exhibits were in a large lobby just outside the main entrance to the hall, and the luncheons and dinners, of which there were several, were held in smaller rooms near the banquet hall. Special credit is due Albert G. Bauersfeld, vice-president, Leonard W. Wahlstrom, secretary, Miss Clara H. Smith, treasurer, and other local members who did a great amount of effective work preparatory to and during the meeting.

After such a convention has passed I have often mentally reconstructed the program. Perhaps we all do it involuntarily. My reconstructed program for this convention is as follows:

I. Three Hundred Thousand More Trained Mechanics and Technicians to

Win the War. An inspiring appeal for teamwork among the educators and school officials of the nation to conduct emergency vocational courses beginning in May, 1918. By Dr. Charles A. Prosser, backed up by a rousing address by Dr. L. D. Harvey.

II. Universal Military Training to become Universal Training for Social Service. A prophetic vision by Dr. Arthur Dean, made vivid and reasonable by America's greatest educational philosopher, Professor John Dewey.

III. Training for the American Industrial Democracy of the Future. Timely prods for industrial teachers by Ruth Mary Weeks.

IV. The Boys must be trained to Man the Farms. How the places of 50,000 men who have left the farms can be taken by boys from 16 to 20 years of age, by Burrige D. Butler.

V. The Educational Opportunity of the Junior Red Cross Work. Presented and illustrated by Dr. Anna Hedges Talbot, and accented by Dr. Edwin G. Cooley and Dr. Arthur D. Dean.

Of course there were other subjects—many of them—but these gave character to the program.

The keynote of the convention was struck by the president, S. J. Vaughn, of the DeKalb Normal School, in his opening address. He pointed out that the readjustments in educational work due to

the sudden change from peace to war make it important that educators come to some conclusions concerning what ought to be eliminated from and what ought to be incorporated into public school instruction. He sounded a note of warning, also, that in this country, as in Europe, many of the women who from patriotic motives and economic necessity have gone into industry and are earning men's wages are not going to go back into their homes, and ought not to, as soon as the war is over. This will mean that the industrial world will not be the same as before the war, and the schools must prepare to help in the industrial courses that will come at the close of the war, as well as to meet present emergencies.

The first speaker listed on the program was William Bachrach, supervisor of commercial work in the high schools of Chicago, who gave facts concerning the war emergency courses conducted by the public school system of Chicago in factories and commercial houses. For instance, he told of the six classes of 30 pupils each at Swift & Co., four classes the same size at Armour & Co., and a school in the McClurg Building to which 47 firms contribute pupils. The policy of the School Board is not to start a class for less than 25 pupils. This is only the beginning of the comprehensive program contemplated.

It was expected that T. B. Kidner, vocational director of the Hospitals Commission of Canada, would be present to give an address on the re-education of crippled soldiers. Major W. H. Henderson, of Washington, also, was expected to speak on the plans of the United States, but owing to pressure of official duties neither were able to be present. Mr. Kidner sent the manuscript of his address from which the following was taken:

May I say, in passing, that the finding of suitable instructors has been and still is one of the difficult problems of the work. Canada, as a whole, had not been considering very seriously the question of vocational and industrial training and our supply of skilled instructors was all too short before the war. But quite a number of these men have gone overseas, and it has been found necessary, in several instances to take them from the combatant ranks to serve as instructors in this country. Also, and this will probably increase, disabled men are being engaged as instructors whenever available. Some disabled men are being re-educated in private institutions, such as business colleges and automobile schools, as both of these lines are being taken up in connection with the classes in the hospitals. It is not probable that many will be trained in this way. Numerous offers are also being received to train men in private workshops. In France this plan was tried somewhat extensively, the men being given an allowance to enable them to live at home. Apparently the plan did not work well for several reasons, amongst them being that no guarantee was given that real instruction would be afforded the pupil; neither was the position of the disabled always satisfactory in relation to the unwounded workman.

Notwithstanding this, we are now endeavoring in Canada to carry out a plan whereby partially disabled men will be received into private industrial establishments for vocational re-education. Amongst other reasons which led us to do this were, (1) the fact that only a limited variety of occupations can be taught in schools; and (2) that in very few cases is it possible to give training in school workshops on commercial lines. As regards the first point, altho nearly 400 different occupations were represented amongst the men who had returned to Canada, it was found that of the first 500 cases undergoing re-education only 39 occupations were included. Further, of the 500, eighty per cent were in about a dozen occupations, largely, it seemed, because training in them was available or easily provided in hospital schools or existing technical institutions. As regards the second point, that school or institutional training is very seldom on commercial lines, this was felt to be a serious drawback.

Dr. Prosser asserted that the present war is a war of mechanism. He said that

for every man at the front there must be two mechanics and technicians behind the lines. There is at present a need for 300,000 more such men who are trained and efficient. "We are sending our soldiers to France without a sufficient number of mechanics to back them up." "There are some respects," said Dr. Prosser, "in which we are but children in the hands of the Germans." As an illustration, he cited the unprecedented place that expert welders are taking in warfare, and then stated that on the best obtainable authority, there are now 80,000 welders in Germany. There were 20,000 at the beginning of the war. Since then 40,000 normal men have been trained, mostly at Dusseldorf, and 20,000 more selected from the amputated men. At the present time the American army needs 12,000 welders but there are not that many in the country. There are about 5,000 welders working in the industries, but most of these are more than 31 years of age. Moreover, they cannot be spared without sacrifice, because the products of these industries are needed in carrying forward the war. We therefore have before us the problem of training 12,000 to 15,000 welders as soon as it can be done. Dr. Prosser made the startling statement that of the 5,000 welders in this country not more than 15 are trained to do the variety of work with the variety of metals that can be done by each of the 80,000 trained in Germany. Welders in this country have usually had experience only in a single job, as welding two rods of the same kind. In other words, they have been developed under a highly specialized factory system, and not in vocational schools where the whole trade is taught. This is only one of many illustrations that might be given to show our need for trained men. Dr. Prosser says we have looked upon mechanical skill as tho "it came like manna from heaven." To

change all this and to do it quickly is the great problem before us. If Congress passes the appropriation of \$25,000,000 proposed for this work every properly equipped school in the country will probably be utilized after May 1 and many schools will be temporarily provided with special equipment to do certain kinds of work not now generally taught in the schools.

Dr. Dewey's announced subject was "Vocational Education in the Light of the World War." In the early part of his address he quoted from Arthur Dean who said recently that "education conscription is the only form of conscription to which, as a permanent policy, the American public is committed, and that it committed itself to universal education conscription quite early in its career. Dr. Dewey then continued:

It is also pointed out that those who have been urging both before and during the war the adoption of universal military training for the male youth of our country between the ages of eighteen and twenty, have put emphasis upon the general educational values—for physical training, for moral and civic training—as a fundamental thing, and it is asked, that if such be the case, why not make the movement frankly and fundamentally an educational movement? Even the military aspects of the war have shown that the most fundamental training which is necessary for the successful military achievement, must be found in the development of industrial efficiency, of industrial resourcefulness, and the adaptability of social co-operativeness.

Is it not then absurd to go on thinking of a universal training for a universal service as if it could be exclusively or even primarily a military training for war service? The only really universal training is for social service, because the only universal service is social service, and the only possible war plan for the re-alignment of our vocational education must then, it seems to me, start along this line: a general national plan for the reconstruction of the conventional European plan of general training of youth into a training for social service.

The address by Miss Weeks on "Making American Industry Safe for Democracy" was one of the features of the convention. She said that whether we like it or not a new element is entering our industry, and that is collective bargaining. This is because industry in the past has too often been an absolutism within a democracy. The vocational schools are a response to a need for more industrial workers—a demand from industry. Men are being trained to run machines, but will that make them good members of labor unions? The workers of the future must not only know mechanism but they must know social science as well. Miss Weeks declared, "No one is fit to teach in a trade school who does not go to meetings of labor unions and learn what the pupils will be up against when they get out, just as he is not fit to teach in such a school unless he comes in touch with manufacturers and business men." The teacher should ask himself, "How well are my pupils fitted for an industrial democracy?"

"The remedy for the I. W. W. is not the policeman but the educator—not the policeman's club but the board of education."

At the last session of the convention the following resolutions were adopted:—

Whereas, our country is now passing thru a great national crisis—a war with a powerful foe, making it necessary to mobilize and make effective every resource, every power at the disposal of the government.

Be it resolved,

That the Vocational Education Association of the Middle West hereby pledges its full and hearty support to the national government in this emergency.

That it plants itself solidly behind the Federal Board for Vocational Education in its efforts to develop and train the youth

and young men of the nation for national service.

That it commends the junior membership and school activities of the American Red Cross.

That it welcomes and stands ready to co-operate with every other agency to carry out the great purpose of the government.

Be it further resolved that we, the members of the Vocational Education Association of the Middle West, hereby express our thanks to the officers and local committees who have contributed so much toward making this a great meeting.

The officers elected were as follows:—

President, Albert G. Bauersfeld, Lane Technical High School, Chicago.

Vice-President, J. W. Dietz, Educational Director, Western Electric Co., Hawthorne Station, Chicago.

Vice-President, L. D. Harvey, Stout Institute, Menomonie, Wis.

Vice-President, R. E. Hieronymous, Community Adviser, University of Illinois.

Treasurer, Mary D. Bradford, Superintendent of Schools, Kenosha, Wis.

Directors (for term of three years):

S. J. Vaughan, DeKalb, Ill.

W. A. Greeson, Sup't of Schools, Grand Rapids, Mich.

Katherine F. Ball, Vocational Adviser for Women, University of Minnesota, Minneapolis.

Alex. Graham, Director of Continuation School, Racine, Wis.

Chas. W. Sylvester, Director of Vocational Education, Hammond, Ind.

Mrs. Helen T. Wooley, Director, Vocation Bureau, Cincinnati, Ohio.

W. F. Shaw, State Vocational Education Director, Columbus, Ohio.

William Noyes, Director of Industrial Education, Duluth, Minnesota.

Arthur D. Dean, Professor of Vocational Education, Columbia University, New York City.

Dr. R. J. Leonard, Regional Agent, Federal Board for Vocational Education, East Central States, Indianapolis, Ind.

EDITORIAL REVIEW OF THE MONTH

PRACTICAL WORK ON A PRODUCTIVE BASIS

AT A recent meeting of the Illinois Schoolmasters' Club where the Smith-Hughes Vocational Education Law was being interpreted the discussion centered for a few minutes on that section of the Law which reads:

That such schools or classes giving instruction to persons who have not entered upon employment shall require that at least half of the time of such instruction be given to practical work on a useful or productive basis.

The question arose as to what is meant by the phrase "practical work on a useful or productive basis." The interpretation of this phrase sent out by the Federal Board in its Bulletin No. 1, (page 43) is as follows:—

This is interpreted to mean work similar to that carried on in the particular trade or industry taught. Such work is on a useful or productive basis when it results in a product of economic value comparable with that produced by a standard shop or factory.

This interpretation and the law itself were evidently intended to make it impossible to have federal aid given to manual training work; they would exclude all over-analyzed, over-organized, stereotyped courses of shopwork. As the result of this, however, if a very strict interpretation is insisted on there may be some danger of swinging to the opposite extreme, equally bad from an educational point of view, where subject-matter is presented in its raw state—unanalyzed, unorganized, uneducationalized productive work. This is even more to be avoided if we are going to produce thoughtful, skilful workmen with the American spirit, and not mere "hands."

It would seem that a liberal interpretation at this point in the law, which would approve what has been called semi-productive work, containing some non-

productive elements, will be necessary to secure the real results aimed at. Otherwise it may become clear that the phrase "practical work on a productive basis" was not the proper language to use in differentiating between shopwork with a general educational end in view and shopwork with a vocational end. Moreover, any narrow interpretation of this phrase would be quite out of harmony with the experiences in some of the most successful trade schools, and recently in some of the corporation schools where the value of the pupil's labor is never lost sight of. Corporation schools have discovered that it is more profitable for the corporations as well as for their apprentices that during the early part of their course of training they be kept in a room by themselves and given non-productive or semi-productive work or both. At the recent meeting in Chicago, J. W. Dietz, president of the National Association of Corporation Schools emphasized the importance of separating the instruction shops from the main part of the productive plant. He recommended that at certain stages in their work the apprentices go back and forth between the two.

It seems only common sense to any man who has high ideals of workmanship and a reasonably broad experience in teaching shopwork that in the early stages of the instruction he cannot possibly get the maximum results in training if the work is strictly on a modern "productive basis." In the later stages of the work it is a different matter, tho even here there must be analysis, organization of subject-matter and work done that is not strictly on a "productive basis." From the standpoint of pedagogy and from the standpoint of economic management non-productive and semi-productive work are

more profitable for beginners than strictly productive work. We hope that this fact may be recognized in the interpretation of the Federal Law.

THIS suggests some interesting observations of methods employed in trade schools. It would seem that the more definitely a school aims at training for skill the more certain it is to give emphasis to the teaching of isolated fundamental elements of skilled processes. For instance, the much abused and much admired historic Russian system of tool instruction as it first appeared in the Imperial Technical School of Moscow, Russia, had for its definite aim the training of skilled workers for the railway service of the nation. It was definitely and strictly a vocational course. The "instruction shops," non-productive and educational in character, where the Russian system of exercise pieces originated, preceded the "construction" shops where the productive work was done. Before this system was inaugurated the shop-work was all on a productive basis; it was the old apprenticeship system adapted to the needs of the government school. But the process of instruction was too slow and results uneven and uncertain by that method alone. It became clear that in the early stages of the instruction it must be possible to make sure that every student received instruction in all the fundamental elements of his trade and that he be given it in such a way as to enable the instructor to determine the progress of the student at any time.

These considerations led to the introduction of the non-productive "instruction shop" as a preliminary stage in the training of mechanics. It was only in the preliminary stage, yet it was that preliminary stage that was copied by the United States and France and England,

and in many cases treated as though it were the whole preparation.

The work in the instruction shop for wood joinery was divided into three stages (1) tool exercises on one piece of wood, (2) joints involving two or more pieces of wood, (3) complete models or useful pieces—what we have called projects. After this work had been completed, under rigid supervision and instruction, the student was then sent to the "construction shop," a productive factory where orders were filled for the government.

The question that has been asked in connection with the discussion of productive and non-productive work in teaching a trade is "Will history repeat itself?" If we wipe off the slate of experience and go back to productive work only will we not find the same defects in the all-productive methods that Della Vas found, and that some of the corporation schools have recently found, and then rediscover what educators ought to know already?

We heartily approve of the productive shop in its proper place in the educational scheme; in fact, we believe it is essential to the highest type of vocational instruction. But we also believe that semi-productive and even some non-productive work is equally essential if thoroughness and economy are desirable.

OCCUPATION THERAPY

AT A meeting called by Surgeon General Gorgas and held at Teachers College, Columbia University, January 29th, the subject of training reconstruction aides was given consideration. The meeting was presided over by Major Henry R. Hayes of the Sanitary Corps, representing the Surgeon General. The others present were Miss Susan C. Johnson in charge of courses for teachers of occupation therapy, Teachers Col-

lege, New York, Mrs. Joel C. Goldthwaite of Boston, Mrs. Herbert Wadsworth of Avon, N. Y., and Washington, D. C., Arthur L. Williston, principal of Wentworth Institute, Boston, and John C. Brodhead, associate director of manual arts, Boston.

Miss Johnson presented facts concerning her course to begin February 6, 1918. (For circular of information apply to the Department of Nursing and Health, Teachers College.) Mrs. Wadsworth presented the matter of subjects to be taught, proportionate time for each, and the question of program.

The meeting dealt with interesting facts relative to the needs of such work in the United States. There are to be built five or six standard orthopedic hospitals, each equipped for from 1500 to 2000 patients, and the problem of training aides for teaching bedside occupations in these hospitals is a branch of service of particular interest to craft workers and teachers.

It has been estimated that out of one million men in the field there will be 250,000 casualties, 50,000 of which will be killed, leaving 200,000 to be treated in hospitals. Of these, 125,000 to 150,000 will be cured within 60 days in hospitals abroad. Those not cured in this time are to be sent home. This leaves 50,000 to 75,000 to be treated in this country; but as estimates show that the patient personnel changes every four months, there will be 12,500 to 17,000 to be cared for at one time.

In Canada it has been found that three out of four soldier patients profit by bedside occupation. In a New York hospital, treating civilians for chronic diseases, it has been found that one out of two needs this kind of work, and that one out of three will make products of commercial value. Such figures carefully gathered

from many sources make it possible to anticipate the probable needs soon to confront us here in America.

The training course for aides which was agreed upon by the committee will be given further study and trial by Miss Johnson who will send a revised outline to other members of the committee for their reactions. The final draft will be passed upon by Major Hayes, then to become authorized by the government as an established basis for a training course throughout the country under government management.

Following is the course as it now stands:

The training will be for ten weeks of five-and-a-half seven-hour days each week. The day is to be divided up into eight periods of about fifty minutes each with the time allotments for the different subjects as follows:

Weaving	56 periods
Leather work	34 periods
Woodwork (toys)	34 periods
Basketry (reed)	34 periods
Pasteboard construction and elementary bookbinding	34 periods
Hospital routine	8 periods
Invalid teaching	30 periods
Wood-carving and engraving	56 periods
Principles of design and color applied to various subjects of the course	56 periods
Practice work	48 periods
Incidental occupations	50 periods

The incidental occupations are rug and mat work, netting and cord work, knitting and crocheting, needlework, stenciling and block printing, modeling with self-hardening clay, and bead work.

In the selection of those to be trained craft workers, teachers, nurses, and social workers will be chosen, as they "are most likely to have the kind of interest and preparation needed for a basis for occupation therapy."

Touching upon the conditions in the hospitals it was agreed that an aide would

be on duty seven hours a day, four of which would be given to teaching. A patient shall be allowed to take but one major and one minor subject at any one time. An instruction period should not exceed two hours in length. The patients will be in groups of ten or twelve and as each aide would teach two sessions daily she would instruct from 20 to 24 men.

The suggested pay of the aides is \$50 a month and expenses in this country, and \$60 a month and expenses if sent abroad. In large hospitals supervising aides with the rank of head nurse will be appointed. While the teacher aides may be trained in different parts of the country the supervising aides will receive their training in a large school in Washington.

Such a program relative to but one part of a big work leads one to realize to some extent the forces which are at work preparatory to meeting the urgent demands the war has put upon us.

WAR RELIEF WORK

AT THE recent meeting of the Vocational Educational Association of the Middle West considerable emphasis was placed on the educational value of the Junior Red Cross Work, and several examples of such work were on display. But, generally speaking, it may be said that the schools are still trying to find things to do that will help win the war. Pupils and teachers want to render service, but they don't know just what to do; they don't know what will be acceptable. It has evidently been necessary for the schools to prove that they can do things before getting much encouragement from headquarters. Gradually, however, it is believed that opportunities for real service within the scope of the schools will present themselves.

One caution was emphasized several times at the Chicago meeting: "Don't

spend money to make things in quantity for the Red Cross until you are assured they will be wanted. Don't send things that have been made until you have reason to know they will be gladly received. And don't expect the Red Cross to pay for the materials you use unless official assurance has been given."

With these cautions we are glad to print the following list of "constructive activities of school children for war relief" which has been prepared by William S. Marten, director of manual arts at the State Normal School, San Jose, California:

FIRST AND SECOND GRADES:

Checker boards and checkers with envelope in which to put the checkers, or case in which to put both board and checkers. Boards made with woven strips, checkered wall paper or oil cloth mounted on cardboard or wood.

Cutting of paper dolls and making of envelope to hold same, these to be put in the pockets of the dresses of refugee children.

Scrap books of muslin and paper covers (suggested size 7"x9"), for the refugee children, *Cutting pictures* from magazines and mounting them in scrap books.

Map and post card picture puzzles, with envelope or case to hold same.

Scraping lint and snipping and tearing scraps for comfort pillows.

Collecting canceled stamps from envelopes, sorting colors, and tying in packages of 10, and these in packages of 100. The older children can peel the stamps from the envelopes. They must not be soaked or steamed off.

Clipping cases of paper in which to collect news clippings and forward to the men at the front.

Knitting of small squares—such as 4" for baby booties or afghans, to be made up by older children.

THIRD AND FOURTH GRADES:

Scrap books with paper or board covers for short stories, jokes and pictures (size suggested size 7"x9"), for the refugee children. *Portfolios for stationery*, of heavy paper or cloth.

Address books to go with portfolio.

Stamp books to go with portfolio.
Calendar and blotter pads to go with portfolio.
Pin balls.
Needle cases.
Knitting needles of dowels or willow.
Map or picture puzzle with case or box to hold same. (This may be of thin wood or cardboard made with the coping saw.)
Dominoes, with cardboard box to hold same.
Checker board and men with case to hold same.
Solitaire board.
Cribbage score board.
Sewing problems for hospitals and refugees, as outlined in the Red Cross pamphlets.
Knitting problems such as baby booties, wash cloths, squares for baby's afghans, caps, etc.
Gun wipes.
Ambulance pillows 13"x17" and 16"x20" of 1 lb. each. Covering of unbleached muslin to contain 2/3 cut-up scraps of goods of any clean materials of fast color and 1/3 shredded tissue paper (old patterns, fruit wrappings, etc.). Tissue paper shredded, not cut.

GRAMMAR GRADES AND HIGH SCHOOL:

Sewing problems as suggested in A. R. C. pamphlets.
Knitting problems such as wristlets, mufflers, socks, etc. A. R. C. 400.
Packing cases for Red Cross, 24"x24"x36" outside measurements, of wood $\frac{5}{8}$ " or $\frac{3}{4}$ " thick, (if for abroad, make ends reinforced).
Reel for winding yarn.
Knitting needles (see A. R. C. 400).
Stocking knitting frame (see Industrial Arts Magazine, Feb. 1918).
Pin balls.
Map and picture puzzles, using coping saws.
Case or box for above..
Games such as:—
Checker boards of wood, and checkers.
 Folded board of cardboard and of wood.
Puzzles (to pack flat).
Chess board and men—of round discs—with the men drawn or printed on.
Solitaire boards.
Cribbage score boards.
Ring-toss games.
Bean-bag games.
Ping pong sets.
Box ball sets.
Case or box for above.
Mechanical puzzles.
Splints of basswood and Yucca pine wood (cut

according to Red Cross specifications: length 17 $\frac{1}{2}$ ", width 3 $\frac{1}{4}$ ", thickness 3/32").

Crutches (from models obtained from drug store).

Hospital trays (from models obtained from hospitals or Walter's Surgical Supply House).

Stretchers (according to military specifications).

Canes (any good strong wood with crook).

Convalescent canvas chairs.

Back rests for convalescent patients (Flat boards 32" long, 18" wide and 1 $\frac{1}{2}$ " thick).

Bedsheet chart holders (models obtained from the Hospital Supply Store).

Bed trays.

Bed cages.

Apparatus for outdoor sports and athletics such as:—

Baseball bats,

Jumping standards.

Bird cages for Y. M. C. A. Building.

Flower boxes for Y. M. C. A. Building.

Chess men (turning problems).

TO MEET THE SHORTAGE OF INDUSTRIAL TEACHERS

CLEVELAND is trying to meet the shortage of industrial teachers by training such teachers in her own schools. The problem is a very definite one, that of training young men to teach seventh and eighth grade classes in manual training centers.

With the beginning of the second semester, February 1, senior boys in the technical high schools have been offered a course looking toward preparation for teaching industrial subjects. Applicants for the course must be at least eighteen years of age. Work in preparation for teaching will be substituted for other school subjects, and pupils will receive credit toward graduation from the technical high schools. Those who graduate from this modified course in June and wish to continue the work, will take a six weeks' course in the summer School of Education. Those who satisfactorily complete the summer work will be given positions in September, with the understanding that they shall make further prepara-

tion for teaching thru extension and summer courses.

The time given to professional work thru the closing semester of the technical high school will be two forty-five-minute periods each day. In the summer school three or four hours daily will be required.

The work will include psychology, history and organization of industrial work, advanced woodwork for technical skill, and freehand and mechanical drawing and elementary woodwork with particular reference to teaching in elementary schools.

About twenty-five young men have enrolled for the course.

TECHNICALLY TRAINED MEN NEEDED

JUST as we go to press a call comes from the ordnance department of the Army for men for clerical, testing, drafting, inspection and mechanical trades positions. The salaries for some of these are as high as \$2,400 a year; many of them pay \$1,500. In the list we notice 500 mechanical draftsmen at from \$800 to \$1,800 a year; 200 "engineers of tests of ordnance material" at \$1,500 to \$2,400; 200 assistant engineers at from \$1,000 to \$1,500; and more than 2,500 positions as inspectors of ammunition, and materials and machine parts of guns, etc., etc.

WASHINGTON CORRESPONDENCE

IMPORTANT CONFERENCES.

THE Federal Board for Vocational Education called a conference of presidents of colleges and deans of engineering schools in Washington on January 11th, to consider the service which these institutions may render in carrying out an emergency program for training skilled men needed in the army and in industries engaged on war contracts. More than a hundred delegates were present, and there was enthusiastic response to the appeal for cooperation.

At the close of the conference, which lasted all day, resolutions were adopted covering the following main points: (1) Urging the Secretary of War to consider the advisability of creating a board or committee to deal with the special problem of providing the skilled mechanics needed; (2) Recommending that such board or committee work, so far as possible, thru existing educational agencies, with authority to utilize available facilities and machinery; (3) Recommending

that an adequate appropriation for the purposes contemplated be made immediately available; (4) Recommending the adoption of the principle of drafting the requisite number of men, and detailing them to selected institutions for specified training, on pay and subsistence; (5) Recommending the adoption of the principle of reimbursing the institutions concerned for the necessary cost of instruction furnished; (6) Recommending that instructors needed for the maintenance of the technical courses be not removed from the institutions by the operation of the draft.

For the purpose of gathering information concerning the facilities available for use in the proposed program, a questionnaire was submitted to the delegates present by the Federal Board, and later mailed to other institutions not represented in the conference.

On January 17th a similar conference was held with representatives of trade and industrial schools of secondary grade, and with similar satisfactory results.

Up to the time of writing official announcement had not been made of the proposed action on the resolution submitted, but it is confidently expected that vigorous measures will be taken to deal with this emergency along broad lines.

MOBILIZATION OF LABOR RESOURCES.

CLOSELY associated with the problem of creating new reserve of skilled workers is that of mobilizing effectively the forces already in existence. An important move in this direction has been made by the Department of Labor, in the organization of the United States Employment Service, which has set as its goal the mobilization of 3,000,000 workers in various trades and occupations.

The chief of the new bureau is J. B. Densmore, of Montana, who for a number of years has been solicitor for the department. He will have two assistant directors of employment, Charles T. Clayton, of Maryland, formerly private secretary to Secretary Wilson, and Robert Watson, of Massachusetts, formerly chief clerk of the department.

Plans have been laid for enormous expansion of this service, in preparation for recruiting the workers needed to carry on the industrial and commercial activities required to support the military forces in the war. Solution of the labor shortage by this means is proposed by the department and the co-operating labor organizations in answer to the suggestion that conscription of labor is necessary.

One early result is expected to be the placing of 400,000 mechanics in shipbuilding plants to aid in hurrying to completion the merchant marine program.

The following paragraphs are quoted from an official statement outlining the organization plans of the new service:

"The United States Employment Service has been divorced from the Bureau of Immigration, under whose control it has been since its es-

tablishment, and made a separate arm of the Department, and one of the largest and most important war-prosecuting organizations of the national government.

"Thru the utilization of existing and projected federal, state, and municipal employment offices, and the labor-supplying facilities of the various state councils of defense, the federal employment service will cover the entire continent with a network of interrelated labor exchanges.

"These will 'recruit' and transfer workers from one section to another and eliminate the present chaotic situation of a surplus of workers in one region and a shortage in another."

BOYS' WORKING RESERVE.

ANOTHER factor in the mobilization of the nation's labor forces that is of more significance than many people realize is the United States Boys' Working Reserve. The avowed object of this movement is the "mobilization of all boys in the country of high school age." Expressed in these terms, the object in view is capable of being misunderstood. Indeed, apprehension exists in some quarters that the Working Reserve has designs on the schools themselves. It is true that some persons in their excitement have urged the suggestion that all high schools be closed in order that boys may be released for various types of hypothetical activities. It has been stated officially, however, that this suggestion is no part of the program of the Boys' Working Reserve.

In the official bulletin issued by the Reserve, boys are urged not to quit school. Emphasis is placed on the seeking of opportunities for service outside of school hours.

No boy should leave his studies to go to work unless he has been so advised by his teacher and by his school superintendent. The future of the United States depends upon the citizen of tomorrow being an educated and enlightened man. Plainly the duty of the young man is to prepare himself for citizenship. But in his vacation time and in his leisure hours he

should devote himself exclusively to the service of the nation.

The United States Boys' Working Reserve is an army of patriotic youths who are 16 years of age or over, and under 21 years of age, organized under the Federal Department of Labor. Its purpose is stated to be to assist in meeting "the shortage of labor made acute, and rapidly growing to be very serious indeed, by the withdrawal of millions of men from farm and shop for the army and navy and for the manufacture of munitions and of other things necessary to the successful prosecution of the Great War."

Organized in May, 1917, the Boys' Working Reserve has already established co-operative working relations in 42 states and the District of Columbia. It does not attempt to displace or disrupt existing organizations, but to utilize and co-operate with them. We believe that school officers will do well to examine carefully its purposes and methods, and to co-operate to the fullest possible extent.

WAR SERVICE CALL TO MANUAL TRAINING CLASSES.

DIRECTORS and instructors of manual training in all parts of the country have expressed a desire to be allowed to organize their shops and students so as to make some tangible and useful contribution in the war emergency.

An entering wedge has been found. Or, to use another figure, a place has been found where the camel can get his nose under the edge of the tent. We hope he succeeds in getting all the way in, and that before long the boys in the manual training classes everywhere will be "in on" some real war emergency work that will count for at least as much as what the girls in the home economics classes have been doing in Red Cross and other activities for months past.

As the culmination of numerous suggestions, and after conferences with appropriate committees, the Commissioner of Education has been authorized to announce that the Army Young Men's Christian Association will be delighted to accept gifts of checker tables from manual training schools or departments. The Association is not in position to furnish money to pay for materials, but will pay freight charges if tables are packed and shipped in accordance with directions furnished.

We predict that there will be no lack of boys having the requisite skill to meet the exacting standards which have been set up, who, with their teachers, will respond enthusiastically to the opportunity offered. And the product will not only be gratifying to the Army Y. M. C. A. and the soldier boys who will use it, and a source of justifiable pride to the school authorities, but we have reason to believe that it will prove an indication of the importance of an hitherto untapped source of supplies concerning which there has been too much ignorance or skepticism.

A circular letter describing the plan has been prepared and distributed widely by the Bureau of Education. According to this letter, there are 32 Army Cantonnments with a total of 500 Y. M. C. A. buildings already erected or projected. Each of these buildings can use to advantage from eight to ten tables; a total of 5,000 tables. It is hoped that several hundred schools or departments will be able to meet the requirements, and willing to donate the materials and labor, and furnish from one to ten tables per school.

The letter includes a dimensioned working drawing of the checker table, prepared from a design submitted by Professor Ira S. Griffith, of the University of Missouri, together with full details and specifications.

OPEN QUESTIONS

"There is more to be said on this subject."

HOW TO KEEP A CHECK ON TOOLS

Mr. Editor:—

We have a good set of hand tools, but there is no way of checking them unless we build a tool room and give out the tools each day. They are now on double benches and are borrowed continually. Would it not be a good plan for each bench to have a locked drawer, and let out the key by the deposit method? Is there any better plan than to keep all supply tools behind a grating and have them issued by the check method? I would be glad to have this subject discussed by someone who has a larger experience.

J. D.

THE CHECK SYSTEM IN THE HIGH SCHOOL SHOP

Dear Mr. Editor:—

In the October number, in the report of Deerfield-Shields Township High School, Mr. Schneider told of a general tool room for the woodworking tools, and a system of giving out tools for checks, and thereby keeping a record of loss and breakage.

I would like to have some definite information of how this system is carried out, and with what results.

I think this the most efficient system of handling tools in a high school manual training shop, and am using it in my shop, but I would like to see this plan discussed in the *Open Questions* and would appreciate information and suggestions from other schools.

Yours truly,

Drumright, Okla.

—PAUL B. HUNTER.

Upon receiving the above letter we wrote immediately to Mr. Schneider for a further statement of his tool room system. The following is his reply:—

The check system as used at the present time in the shops of the Deerfield-Shields high school is the result of six years or more of experimenting. We began where most others begin; that is, having all the individual tools on top of the bench and at the back of the bench on a rack, and all the general tools on a wall panel. This was found unsatisfactory for various reasons, chief among which were the difficulty in keeping all tools in the proper places and the fact that six or eight of the ten tools were only in the way the greater part of the time.

This scheme was followed by having all individual tools for the bench placed systematically in the top drawer of the bench, the same set of tools being used by all students using the same bench. The general tools were still on the wall panel. This scheme was unsatisfactory because the tools were often thrown in most carelessly, causing damage; and drawers became littered with shavings and other waste material because they were usually left open. It also became rather difficult to place the responsibility for loss and breakage immediately and definitely.

This scheme was then followed by having all individual tools numbered, arranged in sets, each set in a box or tray correspondingly numbered, and kept in a separate room. From there they were given out, in complete sets, by the instructor or one of the students. This was unsatisfactory because the tools were never in order in the box, it took much time to check over each set of ten, namely two planes, four chisels, back saw, gage, rule and try-square, as they were turned in, and general tools were still found lying about the shop to some extent. Also, a student was obliged to have the box of ten tools on his bench when he probably needed only two or three, thus interfering with the working space and quite frequently the box with all the tools was pushed off onto the floor, causing excessive breakage and much disturbance.

At about this stage we were ready to move into our new industrial arts building. Here had been provided a room about five feet wide and fourteen feet long as a tool room for the woodworking department, and another about six feet by eight feet for the metal working shops. All tools were placed on panels on three sides of the room, the remaining short side being open toward the shop, and separated from the latter by a counter with drawers underneath and wire mesh partition above. It was a surprise to us to see how small a space was really needed to place tools for classes of twenty-four students in woodwork. The tools most frequently needed, such as planes, hammers, rules, squares, saws, etc., were placed near the front or counter, while such as gouges, plows, compass saw, dividers, etc., were placed toward the rear. Besides space for all the tools, we found room for nails, screws, dowels, stains, shellac, varnish,—

in fact, all the many little things usually placed anywhere about the shop.

When we were ready to begin work each student was provided with a key to a drawer of his bench, five numbered checks, and a plane blade. For these he deposited fifty cents as a guarantee against loss or breakage. Then when he wished any tools he called for them at the tool-room window, giving a check for each tool received, which check was placed on the same hook or nail from which the tool was removed, or as in the case of augers or chisels, on a hook directly under the space occupied by the tool. In this way we could tell exactly which student had which tool.

When tools were brought back, checks were returned to the student and for any tool which failed to come back we had a numbered check in its place, so we could know definitely just who received the tool from the tool room. Furthermore, any breakages would also be discovered at this time if not previously reported.

This system worked out very well as compared to our former experiments, but we still found the following defects:—

1. The boys lost checks or keys.
2. Checks or keys were left at home very frequently.
3. Stain, shellac, and varnish pots, for which we had not been requiring checks, were left on the bench of the finishing room, usually uncovered.
4. Slight breakages were often overlooked in the haste of receiving tools and probably not discovered until some days later.
5. Nails and screws were taken out in larger quantities than necessary and most frequently those left over were thrown onto the floor when cleaning up, resulting in a distinct waste of these supplies.

To overcome the above defects, we instituted the following changes and additions:—

1-2. Each set of five checks was placed on a suitable key ring which already contained the key for the student's drawer, so that checks could be removed without interfering with the key. (Note—not every key ring is suitable, the old type of split ring will not do at all as it breaks too easily and requires too much time for the removal and replacing of the checks).

A suitable cabinet was built and installed near the tool room, where all keys and checks are kept at all times except when the student

is in class. In other words, the keys and checks are never removed from the shop.

3. Stain, of which we use ten or more kinds, and shellac, varnish and filler, are given out for checks, just as tools, and must be returned before the student leaves the shop, as his check tells the story if he fails to claim it. This saves much waste by evaporation. Furthermore, the tool-room keeper is required to enter on his daily tool-room report the name of each student to whom finishing material is issued, the name of the material, and the name of the object on which it is to be used.

4. The tool-room keeper makes a daily inspection of all the tools, and enters on his report such as are damaged or missing, as well as those which are damaged or lost by the class which he has just served. Any tools not accounted for in this way are charged to him and he must make good the loss before he can continue the work in the course.

5. Nails are handed out in a small box, for a check, and the box with the left-over nails is returned in order to redeem the check. Screws are handed out and charged by the tool-room keeper to the student on the daily tool-room report, which he must sign and hand to the instructor before he leaves.

So far everything works well. The only small defect now consists in having some forgetful student take his keys and checks with him, or leave with only three or four checks on his ring. In this case, as well as when he forgets to clean his bench or put away his work, he is fined a small sum. This is deducted from his fifty-cent deposit, and is applied to the purchase of books relating to shop work. Repeated offenses also help to lower his grade for the work done.

Each student takes his turn of serving in the tool room for one week during the semester, and the job is usually awaited with considerable pleasure.

Students in pattern making receive, besides the plane blade, a set of four long bevel-edge chisels and a set of five turning tools, all ground especially for work in pine. These he may keep wherever he chooses and they are charged up to him.

The tools in the machine shop are handled in a similar manner, except that each student has for his individual use a No. 2 "Carr" tool and a forged right-hand and left-hand side tool. We have found that in the last two instances this is the better way.

Highland Park, Ill. —ROBT W. SCHNEIDER.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

A VARIETY WOOD PLANING JIG

THE fixture or jig shown in the accompanying drawing and photograph is designed to hold one or more pieces of wood while planing the edges straight and square. In the opinion of the contributor the use of this jig (a) reduces labor to a minimum, (b) increases production, (c) improves the quality of the model and (d) aids in the acquisition of the knack of planing.

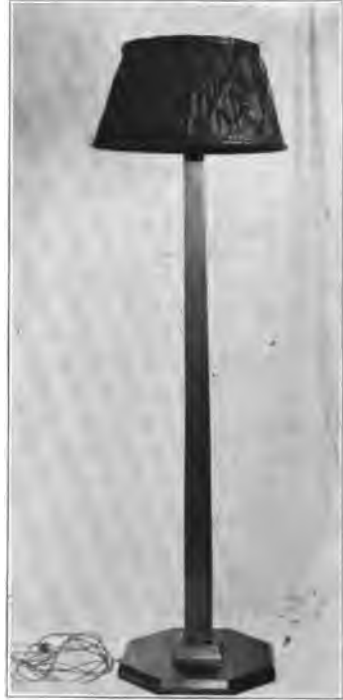
The mill bill for making the jig is as follows:—



VARIETY PLANING JIG.

1 piece 1" x 12" x 40" oak C
1 piece 1" x 5" x 40" oak D
2 pieces 1" x 1 3/4" x 11" oak E
1 piece 3/8" x 1 1/2" x 35" oak F
2 pieces 3/8" x 1 1/2" x 15" oak B
1 piece 3/8" x 1 3/4" x 2 1/2" oak H
Two 1/4" x 1 1/2" sq. head stove bolts

Two 1/4" wing nuts with washers
Ten 1 1/2" No. 10 flat-head screws
Two 3/8" flat head screws.



PIANO LAMP.

ASSEMBLY OF JIG

Bore 1/4" hole at A (end view of jig) for 1/4" square-head bolt fitted with wing nut and washer to clamp pieces B to inside of fixture. Pieces B are also fastened to F by means of flat-head screws as shown at G. E is fastened to C and D with screws and glue. C and D are rabbeted to receive the jack plane (see side view of jig).

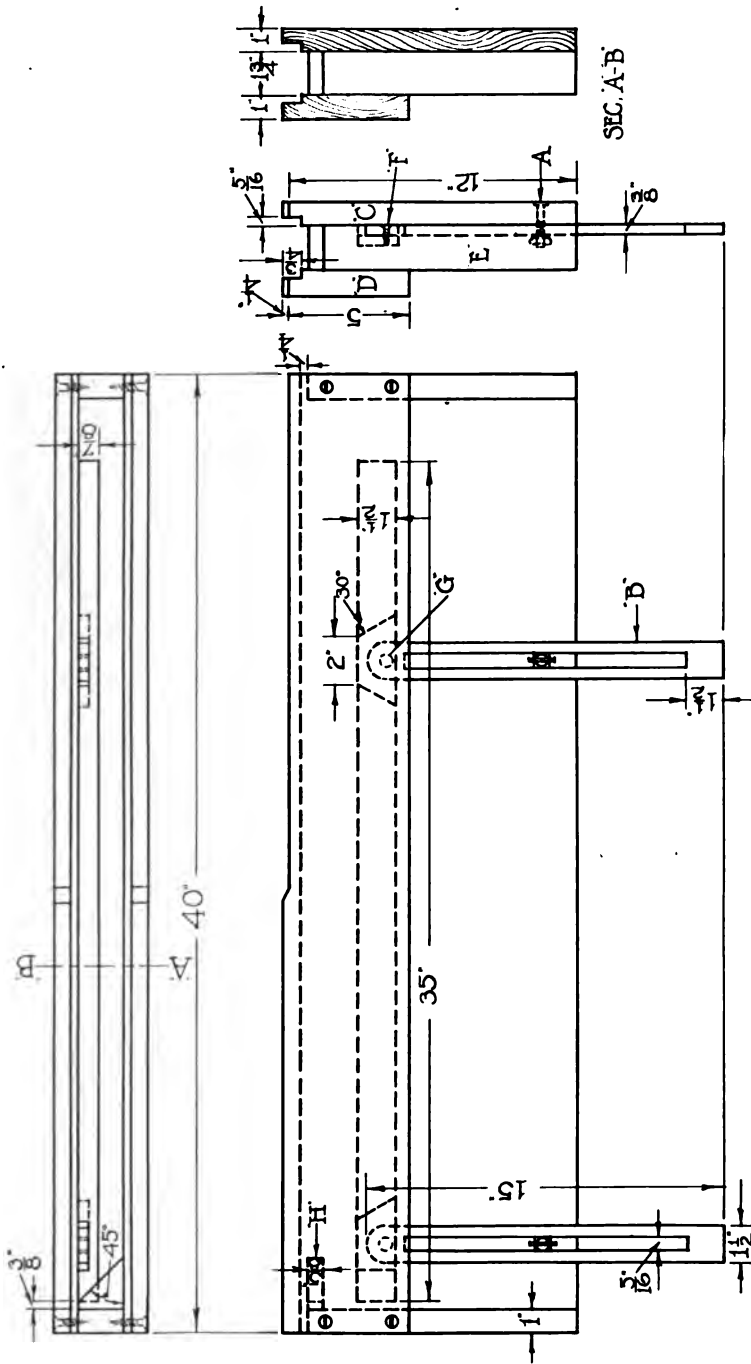
USE OF JIG

Put one end of jig in a bench vise, the other being held by a prop. The pieces to be planed are placed on edge between C and D, resting on F and held in the 45° angle of block H. A small wedge may be fixed to hold the pieces in place while drawing back the plane for a second cut.

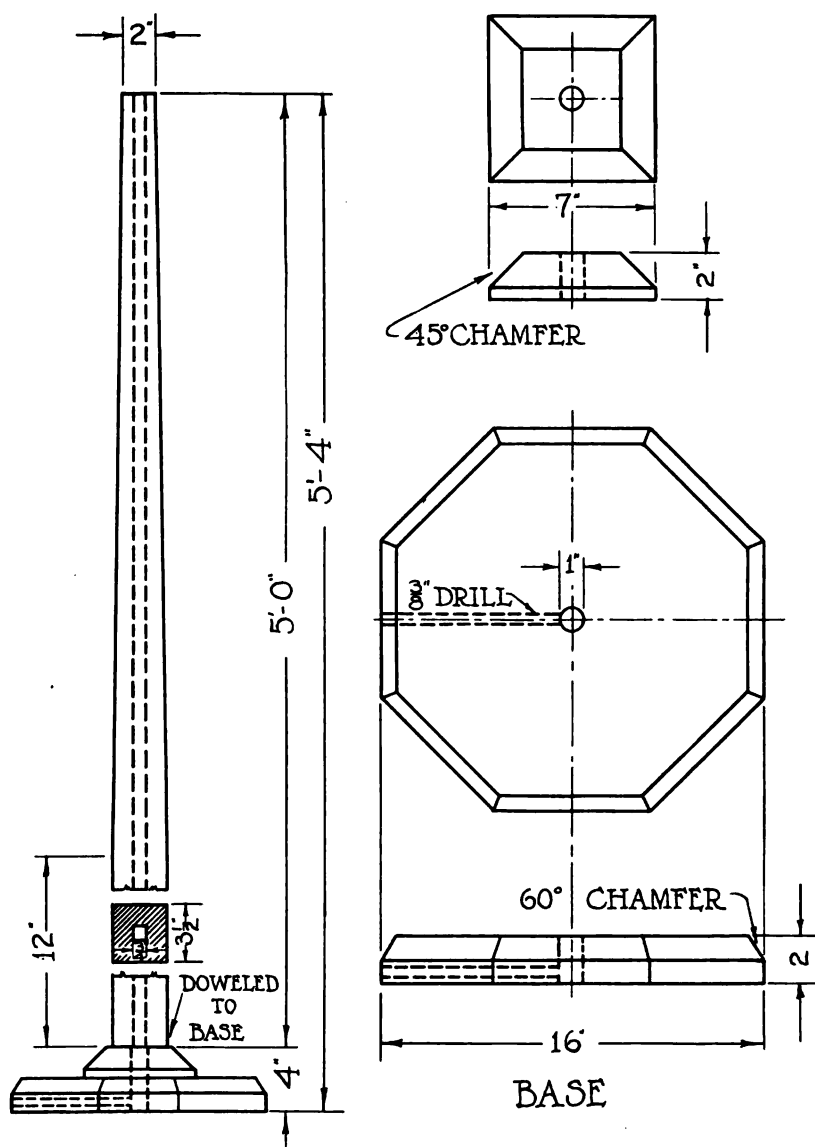
Rochester, N. Y.

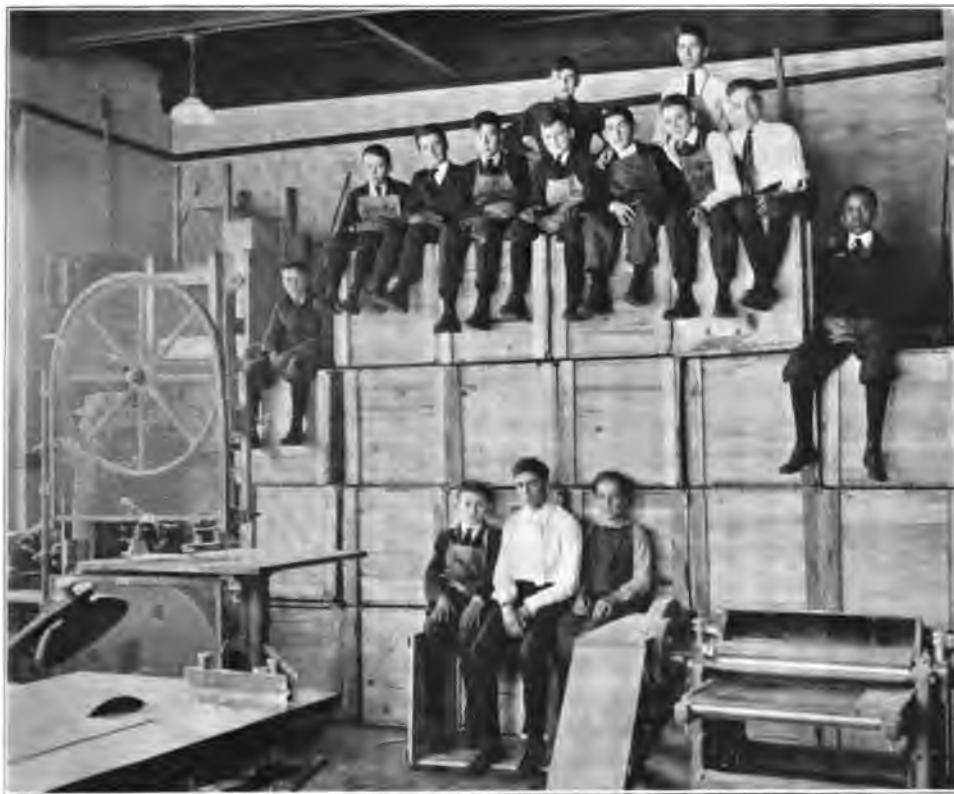
—J. GARFIELD RUBY.

VARIETY WOOD PLANING FIXTURE



PIANO LAMP





THE WORKMEN AND THEIR "BIT."

PIANO LAMP.

This project is popular with boys of the upper grades and high-school woodworking classes. It may be made in a number of ways depending upon the ability of the workman. The shaft may be mitered or made with butt joints. The wire is intended to pass thru a hole in the base and up thru the hollow shaft. Shade and light fixtures may be purchased at pottery shops or fixture dealers.

South Haven, Mich. —EARL R. GILBERT,
Director Manual Arts.

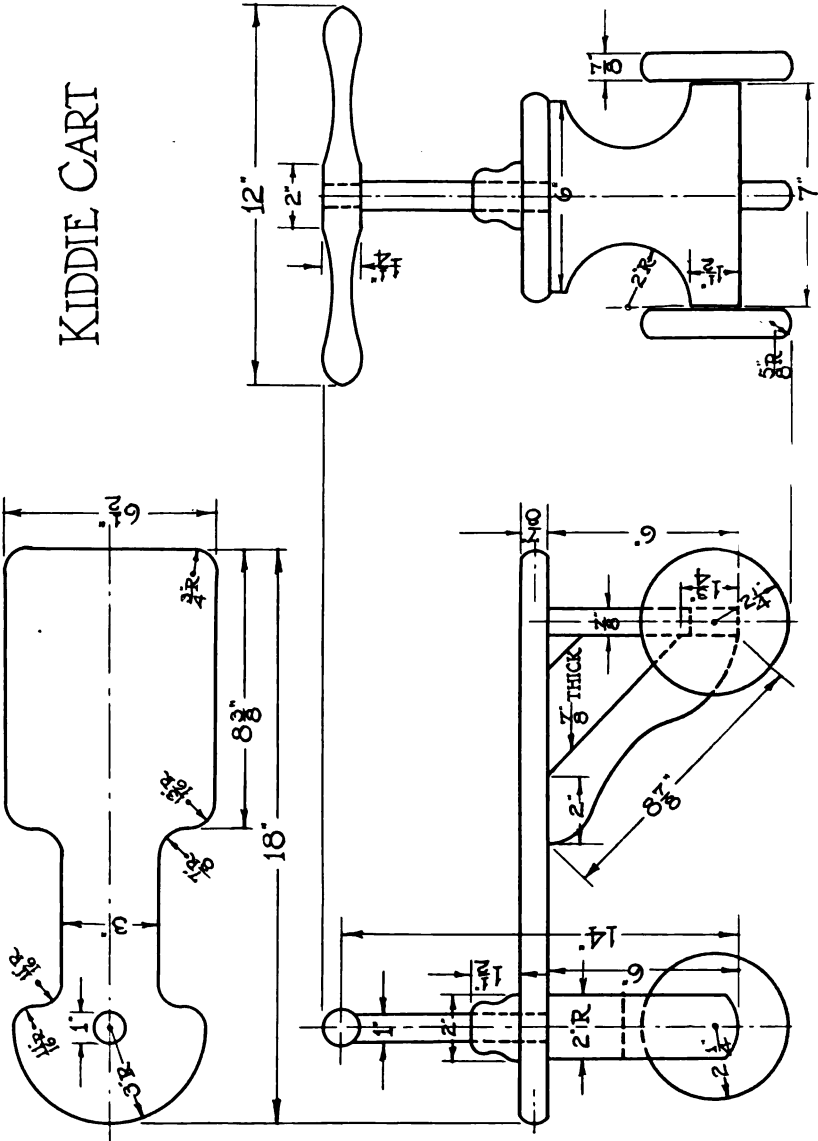
RED CROSS PACKING BOXES

The accompanying photograph shows Red Cross packing boxes built by manual training students at Middletown, Ohio, under E. F. Juergens. The ends of the boxes are 24" square and they are 39½" long. The wood is yellow pine, ¾" thick, with no loose knots.

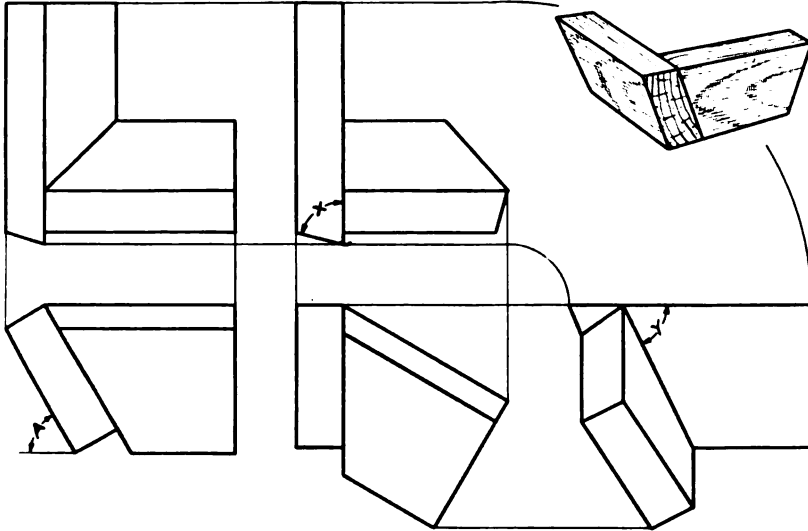
As the circular saw table (see cover page), used in making these boxes, was built to cut stock of only 20" in length, some arrangement had to be made to cut the sides of the boxes. Two holes were drilled near the edge of the saw table and countersunk. A 2" by 2" piece of stock 4' long was screwed to the table in line with the gage on the table. A wooden clamp on this piece can be fastened at any required length beyond 20". With this arrangement a 14' board can be placed on the saw table with one end against the wooden clamp and can be cut into the required lengths. The ends were cut 2' long and any waste was used for the two cleats on each end, and the two cleats on the cover.

The first order was for 24 boxes and they were finished in three days. The boys liked to build the boxes, and especially when they knew they would go to France.

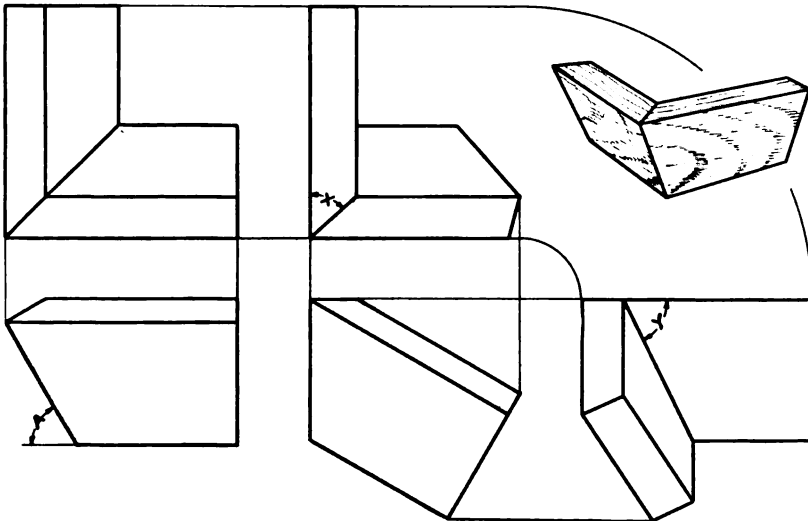
KIDDIE CART



SQUARE HOPPER BUTT JOINT



SQUARE HOPPER MITRE JOINT



NOTE:

A = GIVEN ANGLE OF DESIRED SLOPE

X = END ANGLE TO BE LAYED OFF ON STOCK

Y = SIDE ANGLE TO BE LAYED OFF ON STOCK

METHOD OF LAYING OUT A SQUARE HOPPER BUTT JOINT, FIG. 1.
AND A SQUARE HOPPER MITER JOINT, FIG. 2.

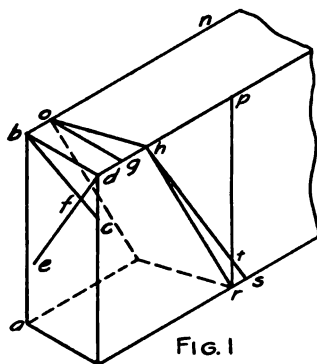


FIG. 1

abc = ANGLE OF SLOPE
 bde = " " "
 og IS PERPENDICULAR TO dp
 $gh = fc$
 nqh = END ANGLE
 phs = ANGLE OF SLOPE
 $ht = pr$ = WIDTH OF STOCK
 phr = SIDE ANGLE

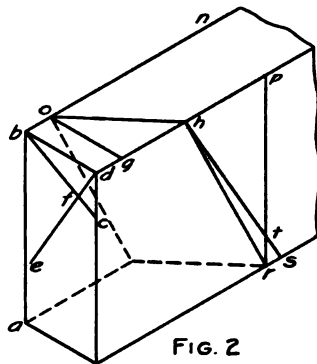


FIG. 2

abc = ANGLE OF SLOPE
 bde = " " "
 og IS PERPENDICULAR TO dp
 $gh = bf$
 nqh = END ANGLE
 phs = ANGLE OF SLOPE
 $ht = pr$ = WIDTH OF STOCK
 phr = SIDE ANGLE

G.M.M.

KIDDIE CART

A popular toy for the little folks is shown in the drawing. Hardwood should be used for the wheels and steering gear. The total height may be varied to suit the child. The Editor has found a satisfactory height can be determined by measuring length of child's leg from his knee to the ground, and then making the height of the seat to correspond. The drawing was contributed by William Noyes, director of manual arts, Duluth, Minn.

A STUDY OF THE SQUARE HOPPER BUTT AND THE SQUARE HOPPER MITER JOINTS

The hopper joints are often puzzling to the woodworker and the "cut and try" method is sometimes used in place of the exact method of laying out and cutting to the line. The ortho-

graphic projections illustrate one method of obtaining the angles x and y , to be laid off on stock, having given the angle A of the desired slope. The drawing shows the joint with the edges of the pieces left square. In making the joint these edges should be beveled before the pieces are fastened together.

The isometric projections show brief methods of determining on a piece of stock the end and side angles of the two forms of hopper joints. Laying out with bevels set to the angles nqh and phr and cutting to the lines will insure a fit and will result in the slope desired.

In concrete work the hopper joint is frequently applied to core forms where considerable draft is necessary. It is also applied to carriage seats, wooden trays, bins, and to the plancher on buildings.

Boston, Massachusetts. —GEORGE M. MORRIS.

At every turn, the boy is shown, not only how to do the work that the blacksmith must know how to do, but he is given the why and wherefore of the processes which enter into the blacksmithing trade and must be mastered.

—Said of Instruction given at Hampton Institute.

CURRENT PUBLICATIONS

Industrial Art Text Books, by Bonnie E. Snow and Hugo B. Froelich. The Prang Company, New York. In eight parts—one for each of the eight grades. Size of each, 7½ x 10 in., 72 pages.

As one looks over this series of books and compares it with the drawing books of twenty years ago, he is forced to recognize the fact that art education in the elementary schools has changed wonderfully in spirit as well as in subject-matter. These books make it as clear as fine illustrations can make it, that school art is now done in the play spirit, as it should be. At last the schools have caught the view-point of William Morris's definition of art, "Art is the expression of man's joy in his labor." Art is no longer laboriously struggling to draw parallel lines, circles and bilateral ornaments. It is cutting with scissors, painting bright colors with a brush, arranging blocks and letters and jolly bits of colored paper; it is making things—block elephants, paper dolls of all tribes and nations, toy furniture to fit the doll families; useful rugs, bags, kites, books and baskets, "cockatoo" birds and pendulum ducks, color schemes for rooms, designs for dresses and hats, and many more—all in the play spirit, but each requiring thoughtful planning and careful work. The ancient stock excuse, "I never could draw, anyway," seems impossible in the atmosphere created by these latest textbooks of art education. Drawing is not omitted; but drawing as an end has given way to selecting, arranging, making, beautifying—expressing ideas that require drawing as a means.

The Psychology of Drawing with Special Reference to Laboratory Teaching, by Fred Carleton Ayer, professor of Education, University of Oregon. Warwick & York, Baltimore, 1916. Size, 5x7½ inches; 186 pages; price, \$1.25.

This book was written from the view-point of a scientist rather than that of an artist. It represents the results of a study of drawing as a device in laboratory teaching. It includes, also, a survey of the existing literature of the psychology of drawing.

Cardboard Construction, by J. L. Noll, supervisor of manual training, Altoona, Pennsylvania. Published by the author. Size, 6¼ x 8¼ inches, oblong; 30 pages.

This book consists of a series of plates designed to assist the teacher in giving a practical course of cardboard construction and elementary mechanical drawing to children of the elementary school. It begins with elementary problems in mechanical drawing and continues to give a great deal of emphasis to the mechanical drawing side of the work. In fact, the drawing is made so strong and practical that it would not be amiss to say that it is a course in elementary drafting made interesting thru its application in cardboard work.

Negro Education. Volumes I and II, by Thomas Jesse Jones, United States Bureau of Education, Bulletins 38 and 39, 1916. Price of Vol. I, \$1.00; Vol. II, \$1.25.

These volumes constitute the most comprehensive study of the private and higher schools for the colored people of this country that has ever been made. It has immediate and practical value of a very high degree. Noteworthy elements in the preparation of this report on Negro education are: (1) Collection of the facts thru personal visitation to the institutions described; (2) cooperation of public and private authorities; (3) the constructive purpose involved in the study and in the presentation of the information. Every school reported upon was visited by one or more of the representatives of the Bureau of Education, and the larger schools were studied by specialists in different types of education. These agents were selected for their knowledge of the various groups of citizens interested in Negro education; they represented the South, the North, and the colored race.

Volume I is a general discussion of the various phases of Negro education. Each chapter seeks, first, to present conditions as they are, and then to outline "means and methods" for the increase of educational facilities and the activity under consideration. Volume II presents a detailed statement, on the basis of a geographical arrangement, of the facts pertaining to colored schools. Every private and higher school for which any information was available is separately described in this volume. Each of the Southern States is represented by a separate chapter, the private colored schools of the Northern States being grouped together in the last chapter of the volume.

The first volume is illustrated with plans of buildings and grounds, and with photographs of exteriors and interiors of school buildings. The second volume contains maps showing the per capita expenditure for white and colored children in Southern States.

The publication of the report has been made possible thru the cooperation of the Phelps-Stokes Fund.

Standards and Conventions—Architectural Drawing, by Irving G. Koehler, Cass Technical High School, Detroit. Published by the Board of Education, Detroit, Mich., 1917. Size, 6 x 8 3/4 in.; 48 pages.

This pamphlet was prepared by a committee of the Detroit Manual Training Club, Mr. Koehler being chairman. It is the result of a rather extended investigation. It covers much more than one would expect from its title. It begins with certain general directions such as how to cut drawing sheets of standard sizes from a 36-inch roll of paper and how to number the drawings. Then follows directions for the lay-out of a sheet, conventional lines, letters figures and dimensions, arrangement of views in working drawings, scale, methods of representing doors, windows, gas and electric fixtures, etc. The order of procedure in making plans and elevations is given; conventional symbols for various materials are shown; also plumbing and heating conventions and some useful tables of sizes, etc.

The compiling of this pamphlet is a valuable piece of work. It is surprising how much important data it contains.

Interior Decoration for the Small Home, by Amy L. Rolfe, Instructor in Home Economics, University of Montana. Published by Macmillan & Co., New York., 1917. Size, 5 x 7 1/2 in.; 151 pages; price, \$1.25.

Everything entering into the subject of interior decoration is covered in this book. Its chief charm, however, lies in the fact that it is written in a rather popular style, thus making a strong appeal to the homemaker who possesses little knowledge of this art. Furthermore the author has treated the subject from the standpoint of people of moderate means, who are not financially able to employ professional interior decorators, and hence have more need for a simple guide. The author has been careful to give also the reasons for the choices suggested, thus making the book of educational

value. The references at the end of each chapter will prove helpful to anyone desiring to make an exhaustive study of interior decoration. The book is fully illustrated.

RECEIVED

The Public School System of San Francisco, California. Report of a survey made under the direction of the United States Commissioner of Education. Bulletin No. 46, 1917. Issued by the Bureau of Education, Washington, D. C. This contains a chapter on manual training, one on vocational education, one on industrial art, and one on home economics education.

Higher Technical Education in Foreign Countries, by Anna Tollman Smith and W. S. Jesien, Bulletin No. 11, 1917. Published by the United States Bureau of Education, Washington, D. C. This Bulletin gives information in regard to standing and scope of higher education in Germany, France, Great Britain, Italy, Austria, Russia, Japan and Canada.

Visual Instruction Thru Lantern Slides and Motion Pictures, by N. L. Hoppingarner and G. S. Wehrwein. Bulletin No. 1730. Issued by the University of Texas, Austin, Texas.

Institutions in the United States Giving Instruction in Agriculture. Compiled by A. C. Monahan and C. H. Dye. Bulletin No. 34, 1917. Issued by the Bureau of Education, Washington, D. C.

Practice Teaching for Teachers in Secondary Schools, by A. R. Mead. Bulletin No. 29, 1917. Issued by the United States Bureau of Education, Washington, D. C. This is a report of a study of institutions with teacher training departments.

When the City Boy Goes to the Farm, by Eugene Davenport, dean of College of Agriculture, University of Illinois. This is Series I of Farm Craft Lessons for high schools. Issued by the State Council of Defense, 120 West Adams Street, Chicago, Illinois. This leaflet was written for the United States Boys' Working Reserve of Illinois.

The Money Value of Education, by A. Caswell Ellis, professor of philosophy of education, University of Texas. Bulletin No. 22, 1917, issued by the United States Bureau of Education, Washington, D. C. This bulletin is illustrated with a large number of interesting charts.

MANUAL TRAINING MAGAZINE

APRIL, 1918

IDEALS OF INDUSTRIAL EDUCATION.

DR. L. G. WELD,

President of the Pullman Free School of Manual Training, Pullman, Illinois.

The following statement of ideals constituted the concluding part of an Address on "The Pullman Free School of Manual Training" presented by Dr. Weld at the recent meeting of the Illinois Manual Arts Association, held at Ottawa, Illinois.—THE EDITORS.

THE time has gone by when industrial education stood in need of vindication; but there are still adjustments to be made. We have entered and are now passing through an educational revolution; the spin of which has been accelerated, rather than retarded, by the world-war. Are we quite sure that, when we have stopped spinning and when something like equilibrium has been restored—are we quite sure that the outcome will prove to be an educational uplift? I fear not—not quite sure. Educational standards are being readjusted and educational values reappraised. Are we quite sure that the new standards will be more rational and consistent than the old, that the new values will not be quoted in terms of hard coin or of war-efficiency? Perhaps not quite sure.

I, for one, have been persuaded—had been persuaded before August, 1914—that the trade school as exemplified in the complex German system, and as it was being rather widely copied in this country, has some very serious defects. I would specifically charge that it tends to crystallize the faculties of the boy (or girl) at too early an age—at an age when they should still be regarded as plastic; that it is too hurriedly assumed that the pupil in the industrial school has not and can not

develop an aptitude for those studies traditionally known as cultural, with the result that he is prematurely led into a sort of intellectual blind alley from which there is little hope of his ever escaping.

This is not as it should be. The trade school that admits the boy of fourteen, say, and keeps him the greater part of the time at the workbench or the machine, teaching him a little English in a half-hearted way that he may know how to spell the names of the tools and materials of his craft, a little arithmetic with exclusive reference to its application to his specific work, a little drawing that he may be able to read blueprints furnished him by someone "higher up," a little personal hygiene that he may keep himself in good working condition, a little civil government in the hope that it may deter him from becoming a red anarchist, and neglecting to teach him anything that tends to develop real character and independence of thought and of action, teaching him merely to make a living, and neglecting to develop in him the least appreciation of the things that make life worth living—the trade school that does this and only this for the boy should have no place among our American institutions.

For this is little better than child labor institutionalized. It deprives the child of

the moral and intellectual training which he should have—and to which the American child, at least, is entitled—and to what end? To make of him a producer at the earliest possible moment. Is not this just what child labor does? Is it not in reality child labor reduced to a curriculum? The movement toward vocational education is in the right direction, most emphatically so. But is it not in some cases too radical? Is it not likely to be directed along too narrow lines? Does it not, in some of its aspects, tend to foster, rather than to prevent, the development of a distinct industrial class—of an industrial caste, even?

It is often assumed—not usually, but too often—that the boys and girls in industrial schools are there for the reason that they are mentally deficient, that what we are pleased to call culture is beyond their reach; as though no pupil of even average ability would voluntarily choose an industrial career. This is a mistake due to academic bias, not a conclusion based upon observation. We have already demonstrated to our own satisfaction—as similar schools have demonstrated before us—that many of the brightest and most ambitious of our young people deliberately choose to learn a trade rather than a profession. And why should they not?

The fact is that the mastery of one of the skilled trades today makes demands upon the intelligence and perseverance of the learner fairly comparable with those made upon the student of the so-called learned professions. This is why so many bright young men are quite as eager to enter our best trade schools as others are to go to the high school or the college; and for the same reason it is folly to presume to conduct a trade school upon a low plane of intellectuality.

Yet there are eminent educators who seem to think that the trade school should

be so conducted as to turn out good everyday mechanics—men who will supply the demand for contented workers at the bench and the machine, and who will not aspire to overstep these bounds and become foremen and superintendents and contractors and even captains of industry, thus to deplete the ranks of industrial workers. Can these same educators, let me ask, conceive of a medical college so conducted as to turn out good, cheap, low grade, illiterate physicians who will supply the great demand for medical attendance on the part of the ailing public, and who will never aspire to overstep these bounds and rise to the highest distinctions which the profession affords? Who of you would send his son to such a medical college if he wished to study medicine?

We hold it to be our duty to every student to see to it, as far as possible, that his training, both technical and academic, be such that he may never find the way to the highest positions offered by his vocation barred by a lack of the necessary education. Moreover, we hold that it is not enough that he be able to make a comfortable living, but that his life should be worth living, as well.

Remuneration in excess of the actual requirements of a livelihood and a fair amount of leisure are the secure and just portion of the modern workman; and his status as a man depends in large measure upon the use which he makes of his spare money and his spare time. Shall the boys of today who are to be the workers of the next decade, be left without those intellectual and spiritual resources which prompt them to seek relaxation from the daily "grind," if such it must be, in those pleasures and activities which make for a nobler manhood and a less sordid outlook upon life? Such is not our ideal. We firmly believe that it is not only important that we should turn out young men who

are well trained in their chosen trades, but also that they should hold right views of life and possess a degree of intelligence which will, at least, place them beyond the sway of the demagogue. Far more is this to be desired than that they should merely become earners of men's wages at the earliest possible moment, only to find themselves wanting in ability to advance beyond the conditions imposed by the first "job" which they may chance to take.

Finally: I would contend, indeed, that we who are engaged in the great work of

vocational education should adopt and make effective in our own field the ideals which have actuated that noble army of educators who have always championed, more than mere learning, those things which make for the uplift of humanity. Let us, too, seek to bring our activities fairly within the scope of the broadened definition of culture which has resulted from the wider outlook to which mankind has attained thru the stress and toil of the centuries.

A GRAMMAR GRADE COURSE IN WOODWORKING

CLARENCE H. LEFLER.

Supervisor of Manual Training, North Division, Peoria, Illinois.

THE question as to just what a course of manual training for seventh and eighth grades in public schools should comprise having so often and for so long a time been under discussion, I can scarcely hope to add much of value to what has been said, but the accompanying outline of the plan that is now being followed in the public schools of Peoria may contain some suggestion that will be of interest to manual training teachers and others concerned with this branch of public school work.

In planning the work of this course, the aim has been to avoid the too common error of concentrating on the acquisition of skill and dexterity in the use of tools without due regard to the fundamental principles underlying all handwork. It was thought this could best be done by refraining from prescribing a set of type problems for each group and limiting the pupil's choice to these. This seems to be the usual and almost universal practice among manual training teachers. In the accompanying course it will be seen that there are just one or two simple exercises required in each of the several groups, and

these are such as are essential to the elemental work of the beginner. When these are accomplished to the satisfaction of the teacher, the pupils are encouraged to choose for themselves, and, as far as possible, with the aid of the teacher, to design their own projects. This will develop in the pupil the power of initiative, and to think and work at the same time, and by the stimulation of pride and interest, thru being allowed to work at something of his own in which he is interested to the utmost, he can be induced to put forth his best efforts, and the results of his manual training will be of greater educational value.

While offering the pupils every encouragement to select and develop their own projects, I deem it essential to the success of this plan that teachers regulate this feature carefully, having regard to the ability of individual pupils and withholding from them permission to begin projects requiring skill and knowledge beyond their ability.

It is a common thing to see seventh and eighth-grade pupils working on large pieces of furniture, such as library tables,

Morris chairs, bookcases, etc.—a class of work far beyond the ability of even the very best workmen to be found among the pupils of these grades. Such projects may look good to the pupil before he begins them, and he thinks it will be just fine to “beat” the other boys by turning out the “biggest” piece of work; and teachers, being anxious to make the best possible showing for their shops, too often encourage pupils to take on this over-load, in the hope that they will be able to work it thru somehow and show the public what can be done. But in nearly all such cases one of two things happen: The first, and the most usual thing is that the teacher has to do most of the work for the pupil; and the second is, that the project is so poorly constructed that it is little or no credit, either to the pupil, the teacher, or the school. It would seem to be better practice to limit the work of the lower grades to the smaller projects.

In a system of schools where several teachers are engaged in manual training, it is essential that all present the subject in the same order, and the same topic at the same time, so that when pupils are transferred from one school to another in the same system, their work may proceed

without interruption, the work being at the same stage in both.

Preparatory to the shopwork of these grades we are giving the boys one year of mechanical drawing in the sixth grade. When this was proposed there was a pretty general expression of doubt as to whether or not it would be profitable to undertake drawing with such young pupils, but experience seems to aid in leading to a favorable conclusion. In this work we are particular to proceed on correct methods from the first, and it not only prepares the pupil to proceed more advantageously with the work of the seventh and eighth grades, but enables him to make a more favorable beginning in his high school drawing.

I might go on at some length, as there are many other features of the subject as worthy of comment as those herein referred to, some of which I would like to discuss; but, as I have already over-run the space for this article, and as just a little increase in its length would not add much to its value, I will only say in conclusion that the plan herein outlined is proving very satisfactory in our schools, and I find very little in it that I could hope to improve much by any change.

PEORIA PUBLIC SCHOOLS, PEORIA, ILL.

CLASSIFICATION AND ARRANGEMENT OF WOODWORK FOR GRADES VII AND VIII.

Based on one hour per week.

In planning the work of these grades the time allowed for the work of each group is based on the average ability of pupils, and teachers are expected to require this amount of work as a minimum. From one-fourth to one-third of the whole time may be devoted to working drawings, and, in the work of the advanced groups of each grade this will be necessary.

The numbers following each sub-division of processes and tools refer to the sections covering the topic in the textbook.

Pupils will be required to provide themselves with *Woodwork for Beginners* (Griffith), and teachers will save themselves time and be able to handle larger classes by referring pupils to the text for answers to questions.

Pupils are to be encouraged to bring in original and selected designs to be worked out in the shops. In regulating this feature teachers are to discriminate carefully, having regard to the ability of individual pupils, with-holding from them permission to begin projects requiring skill and knowledge beyond their ability.

It is essential that all teachers present the subject in the same order, so that when a pupil is transferred from one school to another, the work being at the same stage in both schools, he is not placed at a disadvantage. The work of each group, therefore, should be presented in its proper place, and at the time indicated. However, as much of the work of group 8 may be introduced in the work of the 7th grade as may be found necessary to the completion of the work of that grade.

SEVENTH GRADE

	Processes	Tools	Applications
Group 1 Stock: Practice piece, any size. Time—two weeks	Whetting plane, 30 Adjusting plane, 15.	Plane, 14-15 Oilstone, 30	Practice piece of suitable size for testing adjustment of plane
Group 2 Stock: Pine or basswood, S 2 S. $\frac{7}{8}$ "x6"x10" Time—three weeks	Edge planing, 16-18-19 Testing for width, 6. End planing, 19	Plane, 14-15-16 Try-Square, 6-20	Practice piece, any size that may be made into a cutting board
Group 3 Stock: Soft wood, $\frac{7}{8}$ "x3"x18" Time—six weeks	Surface smoothing, 16-20-31 Measuring, 19 Cross-lining, 19-37 Cross-cut sawing, 11-12-13 Gaging, 5-9-36 Boring, 23-24-25 Sand-papering, 31	Plane, 14-15 Ruler, 4-5-9-19 Knife, Pencil, 5 Saw, 11-12-13 Marking gage, 9 Brace and bits, 23-24-25-26 Sand-paper, 31	Hat-rack, or similar project not involving principles not yet introduced
Group 4 Stock: Soft wood, $\frac{7}{8}$ "x6"x12" or larger Time—three weeks	Rip-sawing, 11-12 Use of chisel, 27-38 Laying out duplicate parts, 37	Rip-saw, 11-12 Chisel, 27-28-30-38	Key-rack, or other similar project not involving new principles
Group 5 Stock: Any soft wood suitable for the project selected. Time—six weeks	Fastening with screws, 34 Fastening with nails, 32-33	Screwdriver, 26-34 Hammer, 32-33 Nailset, 32-33	Nail-box, and similar small projects

The remainder of shop time during the seventh grade year is to be devoted to the construction of small useful or ornamental articles, involving only the principles introduced up to this time.

EIGHTH GRADE

	Processes	Tools	Applications
Group 6 Stock: $\frac{3}{4}$ "x3 $\frac{1}{4}$ "x16" $\frac{3}{4}$ "x3"x6" $\frac{3}{4}$ "x1 $\frac{1}{4}$ "x8" Time—four weeks	Estimating and getting out stock, 1-3 Squaring up stock, 16-17-18-19-20-21 Chiseling grooves, 28 Sawing and chiseling to fit, 13-28-38-39-40 Chamfering, 22	Mallet, 27 Back-saw, 13; and any or all other tools not previously used	Coat-rack, Tie-rack, Practice piece Practice piece

Before beginning the work of this group, at least four weeks should be employed in a thoro review of the principles and processes introduced in Grade VII.

Group 7 Stock: Any materials suitable for the project selected	Practical application of the principles involved in the work of the six p r e c e d i n g groups, including the use of glue and clamps, 35-37	Square, 7 Bevel, 8 Dividers, 10 Gouge, 29 Clamps, 35 Spokeshave, 36; and any or all other tools afforded by the equipment.	Plate-rack. Taborer, Foot-stool, Book-rack, Hall tree, Pedestal, etc.
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Time, including the work of the succeeding group—remainder of the eighth grade year.

Group 8 Stock: Finishing materials	Staining, 41-43 Filling, 43-44 Waxing, 43 Varnishing, 42 Painting, 41-42-43-44-45	Brushes, 42	Finishing any and all work completed during the course
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(Signed) C. H. LEFLER, Supervisor.

A VOCATIONAL COURSE IN MACHINE SHOP WORK.

JESSE F. KOLB.

Instructor in Machine Shop, West High School, Salt Lake City, Utah.

A VOCATIONAL course in machine shop work should be a sequential synthetic group of short unit courses. These short unit courses complete in themselves should offer a wide range of adaptability to individual requirements, such as part-time continuation school, night school, etc. This vocational course must be quite complete as to detail, and cover every part of the machinist's business, or at least those operations which the good machinist must be familiar with to enable him to obtain and retain profitable employment.

Such a course may be successfully taught in a high school where adequate equipment and sufficient time allowance are provided. Starting vocational classes in a high school machine shop usually necessitates the purchase of additional equipment. But in the West High School in Salt Lake City this is not necessary because the shop is equipped with the best and latest machines. The only machine that should be a part of the equipment in a vocational school which we do not possess is a universal grinding machine.

The machine shop equipment consists



MACHINE SHOP, WEST HIGH SCHOOL, SALT LAKE CITY.

of twelve benches and vises, five lathes of the quick-change, variable-speed type from 12" x 5' to 18" x 12', one 24" x 24" x 6' planer, one 18" x 18" x 24" shaper, one 18" x 18" x 36" universal milling machine, one 20" geared drill press, one 14" friction drill press, one wet grinder, one drill grinder, one center grinder. Each of these machines have an independent variable speed motor drive plus the usual equipment accompanying each, and a metal tool-and-waste cabinet. The tool room is well equipped with all the necessary small cutting tools, fine tools, supplies, etc., to accommodate about twenty students each period. The number of students admitted each period is, however, limited to twelve because of the limited number of machines available.

The output of the class work of the shop has varied from exercises to finished machines, the former being used only when necessary. The machines of the other departments have been repaired, and now

there is no machine in the building that is not in fine working condition. The machines repaired include electric motors, fans, wood and metal lathes, jointers, planers, band-saws, metal shears, sewing machines, and automobiles. The machines built by the students are several bench grinders (power driven), a thirty-ton screw press, a two H. P. gas engine, and a lot of miscellaneous projects. The repairing and building of these machines has been subordinate to the real aim of the course, that of giving proper instruction, and may therefore be termed a by-product. The surplus product has in each case been sold to the students for the cost of the material used.

The foregoing outline is divided into four parts by double lines to give an idea of the relative amount of time allotted to the work, each of the groups included between the double lines receiving an equal apportionment.

OUTLINE FOR VOCATIONAL CLASS.

MACHINE SHOP.

PROCESS.	APPLICATION	EXERCISES ILLUSTRATING THE PROCESS.
Lecture and notes on equipment, shop ethics, etc.	General.	Shop equipment, toolroom regulations, shop ethics, care of self, care of tools and machines, SAFETY FIRST.
Grinding.	Grinding chisels, drills, other tools.	Chisels, center punches, scribes, scrapers, dividers, drills, etc.
Hammering and sawing.	Riveting, chipping, keyways and key-seats, sawing (hand).	Table, face-plate, shaft and pulley, flange coupling, dowel block, and other machine parts.
Filing and scraping.	Removing tool marks, finishing of plain and warped surfaces.	Nut and bolt, dowel block, spotting plate, pulley and shaft, etc.
Measuring and laying out.	Laying out of rectangular and cylindrical drill work, measuring.	Table, dowel block, shaft and pulley, flange coupling, bench grinders, etc.
Key fitting and broaching.	Cutting holes of irregular shape.	Pulley, flange coupling, dies, spring collet.
Lecture on the elements of mechanics, their application to machine tools and other equipment.	General.	Mechanics as given in physics and their application to rotary and reciprocating machines and tools, friction and lubrication.
Drilling and reaming.	Drilling to lay-out.	Table, dowel block, flange coupling, emery grinder, etc.
Thread cutting.	Thread cutting by hand (tap and die).	Bolt and nut, other machine parts.
Straight and taper turning.	Accurate turning with the lathe.	Arbor, boring bar, pulley, shaft, gear, reamer special exercise, screws.
Screw cutting.	Accurate threading with the lathe.	Cap-screws, special exercise, taps, machine parts.
Drilling and boring on lathe.	General.	Screw jack, pulley, spring collet, machine parts.
Planing.	Planing large and small surfaces on planer and shaper.	Machine parts.
Milling.	Accurate drilling and milling of machine parts and small tools.	Gears, reamers, jigs, taps, drills, machine parts.
Grinding.	Accurate grinding of fine tools.	Snap gages, tap, reamer, machine parts.
Repairing.	Repairing small tools and machines.	Gear, reamer, jig, soldering and brazing, babbitting bearing.
General work on machines, bench and assembling of machines.	General.	Gas engine, bench grinders, drill press, motor, screw press, hydraulic press, water motor, blower, etc.

Parts of machines are used as substitutes for exercises where the same principles are involved. The laboratory work is supplemented by the use of a text, Kaup's "Machine Shop Practice."

The element which received most attention in organizing this course was the proper sequence of processes. By this is meant that an effort has been made to place those tools and processes first which are used most, a knowledge of the use of which is necessary in making a profitable

The cap for the bench grinder, shown near the lower left-hand corner of Fig. 2, is to be laid out, making use of several new tools: surface-plate, scale, surface-gage, dividers, center-punch and hammer. The gear for bench grinder, also shown in Fig. 2, brings into use two

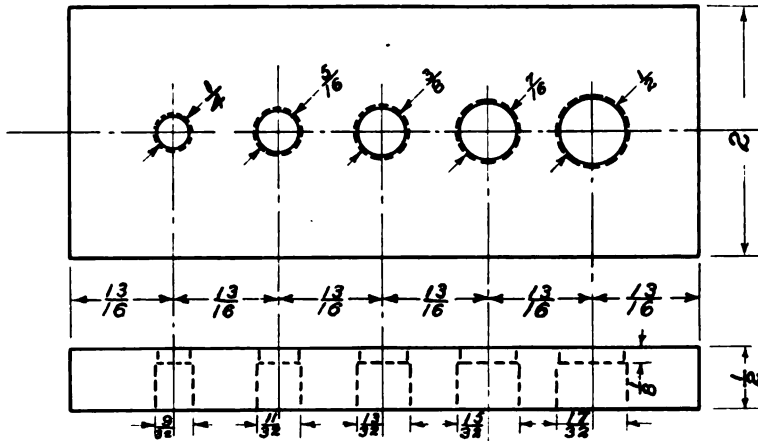


FIG. 1. DOWEL BLOCK.

study of the succeeding ones. This idea is carried out in each of the several units included in the course. The projects are also arranged, first as exercises, and later these are used in making machines of different kinds.

PART ONE.

In teaching the course those hand tools which are used first and most often by the machinist are introduced first. After a short talk on abrasives and their action, the student is required to learn to grind and keep the tools he uses ready for use. The dowel block, Fig. 1, is laid out in a way requiring the use of the hermaphrodite caliper, dividers, scale, center-punch and hammer to find the center of the upper base of a rectangular solid and the distances from center to center of the holes, and to circumscribe a circle about these centers and prick-punch for drilling.

more new tools, the scribe and the box rule to lay out a key seat.

From the outline it will be apparent that several of the exercises or machine parts are used to illustrate the principles included in several of the units. For example, the pieces named above are used as exercises in three or more of the groups. After laying out several pieces of work the student is required to learn to chip one or more pieces until he has mastered at least the elementary processes and then he is given a rest until such a time as he is willing to do the work without thinking it a bore or task. The only exception to this rule is when strictly short unit courses are taken, and then the student is required to take a progressive series of exercises which includes the use of all the tools and principles employed in connection with that kind of work.

PART TWO.

The second part of the course is given to the operation of machines. Before starting the demonstrations a talk on mechanics is given for the purpose of

is next explained with relation to the different kinds of bearings, different weights and speeds, and the kind and amount of oil to be used in each case.

In connection with the drilling they are



FIG. 2. SHOP PROBLEMS.

giving the student a method of analysis by which all machines or processes will be made more intelligible with less effort on the part of either pupil or instructor. The lecture on the machines begins with a review of the history of the growth of machine tools. Starting with the most primitive tools such as splinters, clubs and rocks, and showing by development how the use of these crude tools and the analytical attitude of the human mind eventually brought about the introduction of the elements of machine construction and then thoughtfully put these elements together to form a complicated piece of mechanism or a complex machine.

In teaching the practical application of the laws of matter and motion to the construction of machines, the elements given most attention are the inclined plane, lever, and rotary and reciprocating motion. Different kinds of mechanisms are then examined and analyzed by the members of the class.

The theory of lubrication and friction

required to use tables and formulas for calculating the size of the holes to be drilled for taps, a handbook (Ma-



FIG. 3. GRINDER.

chinery's) and a blueprint being used for reference. The parts previously drilled are then tapped, and a bolt and nut threaded to fit.

Their work in turning is started by using up scrap material to turn blanks for cap-screws of different sizes. This preliminary work is required of the students

with the idea of giving them an opportunity to familiarize themselves with the operation of the machine and learn to caliper with the spring caliper when set to a scale. This work must be accurate within two or three-thousandths of an inch, before they are permitted to start

attitude on his part is very noticeable. These exercises are followed by turning a taper on a center for his machine and fitting the same. After these first exercises the work is of a general nature, finally including a crank shaft, or some other equally difficult piece of machinery.

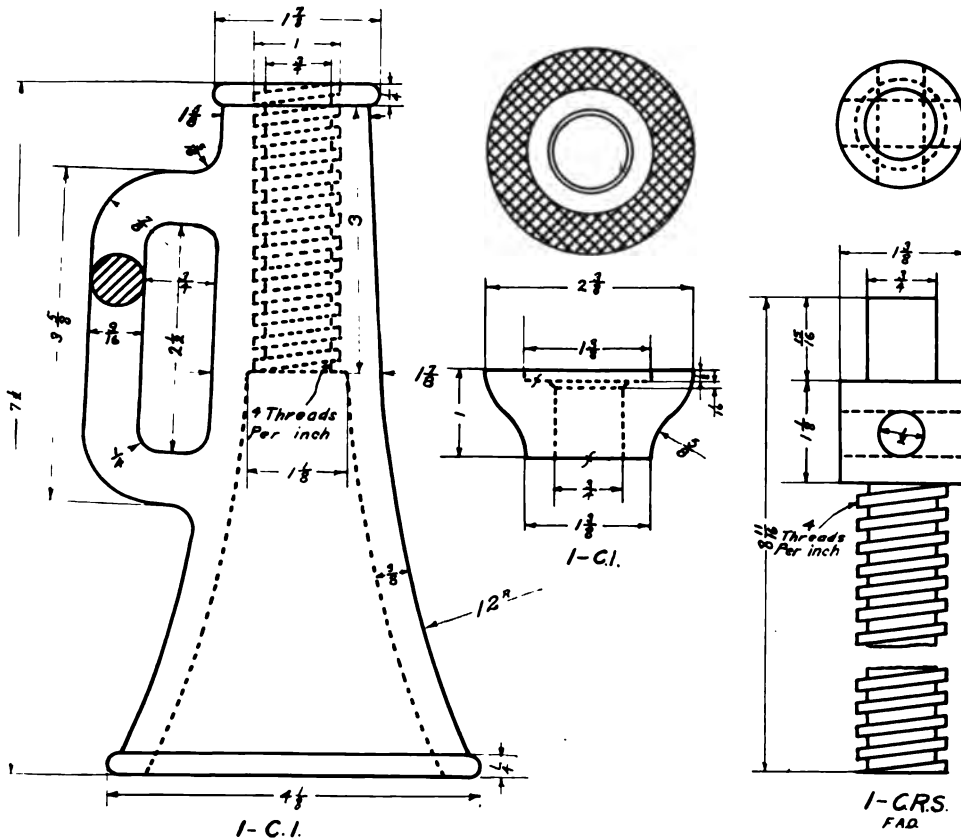


FIG. 4. SCREW JACK.

on a more difficult problem. Sometimes a special exercise is used to make sure of the ability of the student in turning and threading, but as a rule the shaft for the grinder, Fig. 3, or shaft for water motor, or the screw for the screw jack, Fig. 4, are used because they can be used later in building some machine. The fact that the boy knows that a piece he is making is to be used later in the making of a machine adds interest, and a solicitous

The exercises previously finished on the lathe are next threaded in the same order as they were turned, other pieces being added to give practice in cutting all of the standard threads.

The drilling and boring on the lathe is taught by using the pulley for the grinder, Fig. 3, or collars for the grinder, the screw jack base, Fig. 4, housing for bench grinder, cylinder for the gas engine, Fig. 5, etc. Then in-

ternal thread cutting is taught by using a number of other pieces not indicated above.

The last experiences on the lathe are the use of the turret head in turning, and the "geometric" screw-cutting die head in the threading of machine screws to illustrate the processes of duplicate rapid manufacture of parts.

I am going to assume that the foregoing illustrations of the organization of the subject-matter is sufficient to show how each of the units of the course has been treated.

IN GENERAL.

In teaching this course and its several component parts as shown in the foregoing outline, the aim has been: first, to help the student analyze the problem before him; second, to teach him by explanation and demonstration—first as a member of the class and later as an individual—those fundamental operations which are characteristic of the class of work in hand, or of the machine he is using or must use in operating upon the piece to be finished; third, to teach him a correct method or system to use in attacking a problem, the use of which should enable him to carry forward the work in the most efficient manner.

After instruction has been given, the student is admonished to be careful to

keep in mind five standards, giving them preference according to their position:

- (1) Use the correct method of analysis and procedure;
- (2) Be sure your measurements and movements are accurate;



FIG. 5. GAS ENGINE.

- (3) Give to the work the required finish;

(4) If you have attained a fair degree of excellence in the above three, consider the advisability of speeding up, remembering that excellent slogan, "safety first";

(5) After considering your ability, and the possibilities in the machine, speed up to a point where either you or the instructor feel that some one of the first four suggested standards must be sacrificed.

THE PHILADELPHIA MEETING OF THE NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION.

ROBERT C. CRAIG,
Teachers College, New York, N. Y.

THE last meeting of the National Society seemed to indicate a tendency to present definite and concrete ideas and accomplishments and to draw away from the vagueness and generalities which are apt to characterize such conventions. Particularly was this true in the presentation of the results which have

been attained in some of the industries which have established schools for the training of their workers.

The co-ordination of education and industry was brought out particularly well in the address on "Vocational Education in the Government Service" by E. E. MacNary, expert in industrial training.

Division of Construction, U. S. Shipping Board. Mr. MacNary showed how the men who are selected to be trained as instructors in ship construction are drawn directly from the trade and given an intensive course in methods of instruction under trained educators. These men are taught to analyze their work for presentation to future learners and how best to impart their knowledge to others. The instructors thus trained then return to the shipyard and instruction is given on the actual job.

The importance of training in industries necessary to the carrying on of the war was brought out strongly thruout the meeting. In this connection Edgar C. Felton of the Pennsylvania Committee on Defense pointed out the possibility of increased industrial training in the trades allied to shipbuilding in order to keep this very necessary industry going at full capacity. Arthur L. Williston urged the use of the industrial schools of the country in training for war industry and showed some very interesting pictures of work which had been done at Wentworth Institute, Boston, in training army engineers.

Dr. Prosser reviewed the work of the Federal Board for Vocational Education, emphasizing the fact that the states must see that their programs come within the federal law if they are to profit by the funds provided under the Smith-Hughes act.

Some very interesting and significant facts in regard to the vocational re-education of crippled soliders were brought out by Frank W. Merchant, director of industrial training in the province of Ontario, Canada, and by Douglas C. McMurtrie, director of the Red Cross Institute, New York. Mr. Merchant said that out of 400,000 men who had gone from Canada to the war, 20,000 wounded have been returned with some physical disability

which makes necessary their re-education in some form of productive work which will make them self-supporting. Every effort is being made to so train these men; the most difficult problem being the selection of men for the different possible vocations. The new vocations are related as closely as possible to those in which the men have been employed in the past. After the occupation has been chosen the re-education is comparatively simple. The work is carried on in the regular technical schools in special classes. Educational therapy in which music may be used to great advantage has been found to be very important.

Mr. McMurtrie reviewed the work which has been done in France and England in training disabled soldiers, and showed how much more satisfactory it is to train a soldier to earn his own living than to pay him an inadequate pension which encourages him to idleness. He gave as the aim of his work the effort to have no social or economic cripples resulting from our participation in the war.

Richard B. Jones of the Bureau of War Risk Insurance called attention to the fact that there are probably 20,000 men injured in industry in this country every year and that these men should be given the opportunity of re-education.

As the representative of labor, Hugh Frayne, general organizer for the American Federation of Labor, pledged the support of labor to a program of vocational education with the understanding that the interests of skilled labor should not be endangered by giving specialized instruction in a branch of a trade and sending out the workers in competition with skilled tradesmen.

On Thursday evening a round table discussion of industrial and vocational instruction under the Smith-Hughes act was held. At this meeting there was an ani-

mated exchange of experience and opinion between professors of education, labor representatives, and men engaged in administration of vocational education which furnished a concrete basis for thought on the subject.

The meeting on Friday afternoon was probably the most vital of the whole convention. Definite problems which have arisen through the need of increased production to meet war demands were discussed and steps which had been taken in industry to meet these problems were presented. Miss Edith Campbell emphasized the necessity of government legislation for the benefit of the enormous number of women who are going into industrial work. Miss Campbell is serving on the Committee on Women in Industry, Council of National Defense.

Stanley Zweibel, director of industrial education, Bethlehem, Pa., told of the work in training workers in munitions factories. Men are taken out of the shops and given instruction in teaching. Each teacher is then given four green hands whom he trains in machine production. In case the instructor is found to be unqualified for the work he is returned to his regular work and another taken out in his place. Mr. Zweibel says that he finds women easier to train than men.

Miss Gilson of the Clothcraft Company told of her work in training clothing workers. She pointed out the possibility of training workers in several different branches of garment making so that they will be able to fill in wherever the demand arises.

On Friday evening two important dinner-conferences were held, one on special problems of war work in the schools, and one, called by the United States Commissioner of Education, to discuss certain proposals for the training and certification of

industrial teachers. A brief report of the proceedings of this conference has been prepared for distribution by the Bureau of Education.

Some interesting contributions were presented at the reunion of the Alumni Association of Teachers College on February 22-23.

Dr. Dean of Teachers College talked on "Lessons from the 1917 Farm Work for High School Pupils." He showed that valuable farm work was done by high school students last year after the farmers had been convinced that town boys could be of real service on the farm. This value might be made more quickly available, he said, by giving a short period of instruction in farm work before the boys go into the country. He also emphasized the necessity of a short working day for the younger boys, and showed that boys should be recruited in such manner that boys from the same school would be gathered in the same camp or locality.

Dr. I. L. Kandel spoke on English education in war times; the theme of his talk being on the tendency away from the early specialization in industry in the English schools. He said that it is probable that the age of compulsory school attendance will be raised to eighteen.

Dr. Prosser brought out strongly the necessity of boys staying in school at this time and of going through both high school and college if possible, in order to furnish the leadership which is going to be such a vital factor in the reconstruction period.

Several departmental meetings were held at which valuable suggestions were made. The annual meeting of the Teachers College Alumni Association is coming to be recognized as one of the important educational conferences of the year.

EDITORIAL REVIEW OF THE MONTH

SCHOOLS ASKING FOR AN OPPORTUNITY TO HELP THE RED CROSS.

ANYONE who reads the newspapers and magazines can hardly think of anything but the war. This is especially true during these spring months when our own American boys are going "over the top," and when we are speeding up at home.

The result is that everybody wants to help, and nearly everybody is helping. But some of the boys in the manual training shop want to help much more than they are allowed to do. An illustration of this is found in the continued hesitation of the Red Cross to accept the offers of the manual training schools.

Probably there are two reasons why many of the offers from high schools have not been accepted. The first of these is that the officials do not realize what excellent products such schools can turn out. The second is that there is no centralized system of receiving, inspecting and accepting supplies that would insure a uniform product. This latter fact was brought out in a letter written by Miss Helen Cutter of the National Headquarters of the Red Cross to Miss Justine R. Cook, director of the Junior Red Cross membership, Chicago. This letter was sent because of the most commendable efforts of William J. Bogan, of Chicago, to induce the Red Cross to co-operate with the Lane Technical High School. This school had made some excellent pieces of wood furniture and supplies such as are constantly needed by Red Cross physicians and nurses. It had, moreover, made complete detail drawings and blue-prints so that other schools could produce these standard pieces of equipment. There was no question as to the quality or correctness of the product, yet the Red Cross refused to order any

of them. The following quotation from the letter referred to above points to the weak link in the connection between the manual training schools and the Red Cross organization:

As for the mess tables and operating tables, you are advised that we have several thousand of these already made up for many months. The same may be said of the fracture boxes and folding bedside tables. Of the trays with folding legs, we have already bought ten thousand, and it is probable that we shall not buy any in the near future.

When these articles are bought, they are usually contracted for in large quantities, and very often require extensive manufacturing facilities, for handling them. It is manifestly impossible for the Medical Department to place orders for such articles in lots of forty or fifty from many places thruout the country. If this work is undertaken at all, there should be some arrangements made by which the Medical Department could place orders with some central authority, and let this authority handle the details of the business with the various technical schools, etc., thruout the country.

Even when larger quantities are offered the official who has the purchasing power still prefers "to use the regular government requisition channel," but it is possible that continued demonstration of the quality excellence of technical high school products, and a system of receiving and inspecting these products at a central point may bring about the desired co-operation. It is clear that some of the Red Cross officials are working for a fuller co-operation with the schools. The last paragraph of Miss Cutter's letter begins thus:

I am disappointed as you are, even more so, to think we cannot handle orders for medical and hospital supplies, but I am willing to abide by the ruling now set forth, and hope that in time we may be called upon to ask the schools to handle supplies for the army. Since talking with you about this matter, four other schools have been trying to make similar arrangements thru the supply depot.

If, for example, the schools that are qualified to produce the supplies needed could be placed on an accredited list, the Red Cross would be protected in giving orders and the schools would have a new incentive of great educational value.

THE FARM MACHINERY SITUATION.

THE above is the title of a leaflet written by A. E. White, assistant professor of farm mechanics at the University of Illinois, and recently sent out as Circular No. 210. The purpose of this leaflet is to urge farmers to be especially forehanded this year: To purchase new machinery early, to order duplicate parts at once if they are likely to be needed during the coming season, and to overhaul all old machinery and implements and put them in perfect repair before the busy season opens. The following excerpts suggest the character of the appeal:

The present labor shortage can be partially offset by an adequate supply of machinery to insure the proper planting, cultivating and harvesting of a large crop. Stock should be taken of the machines on hand, keeping in mind the labor conditions and the crops which should be planted. * * *

Under present conditions, neglecting to care properly for farm machinery is certainly unpatriotic. Go over every implement, putting on repair parts, tightening the bolts, and replacing wooden parts which are worn out. Sharpen all soil-preparation machines, such as plows, disk harrows, and spike-toothed harrows. Give the cultivators an overhauling. Put the mowers and binders in repair. Clean out all the oil holes. Secure new bearings where they are needed. Have this work done on the farm or at the local blacksmith shop. The efficiency of farm machinery can be greatly increased for the coming season by careful attention to the above points. All this should be taken care of *before the spring work opens*. "Do it now" is the motto for repairing farm machinery. * * *

It is imperative at the present time that every precaution possible be taken to lengthen the life of machinery. Raw materials are scarce, labor difficult to secure, and in addi-

tion to the domestic demands, the American manufacturer must supply our allies with farm implements. In some lines, orders from England and France have increased 500 per cent. since the war started. Here is an opportunity to render direct service! Care for the American machinery, thereby making available an adequate supply for our allies across the sea.

This ought to be a suggestion to teachers. Why not establish farm implement hospitals in every manual training school where there is a forge and an engine lathe, provided it is near the farmers who need help? In this way a teacher and his boys might help materially in food production this year.

THE BOYS' WORKING RESERVE

THIS country will soon have 2,000,000 men in military service. Most of these have been taken out of productive industries. There is therefore a present shortage in the labor market and this shortage is likely to grow. It is going to be felt by the farmers this year, especially because the farmers are being asked to increase their crops. The usual amount of grain will not satisfy; there must be enough for ourselves and much besides for our allies. To win the war it is imperative that production be largely increased. Whence shall come the necessary laborers?

The following answer to this question has been prepared by Emery Filby, of the University of Chicago, who was in charge of a group of Chicago boys who worked on farms in Indiana last summer:

The labor shortage brought about by the war is coming to be one of the acute problems with which America must deal. This shortage will be the more keenly felt as spring advances and heavy demands are made upon agricultural labor in an effort to produce record crops to feed the nations at war. The national government has sensed this problem and has already set in motion machinery looking to the utilization of the full man power of the coun-

try in an effort to meet the situation. The U. S. Boys' Working Reserve is the organized expression of this effort. This organization is under the direction of the Department of Labor at Washington with a national director, William E. Hall, and state directors in each zation are under the jurisdiction of the State Councils of Defense, with branch organizations of the states of the union. These state organizations in each county.

The U. S. Boys' Working Reserve was organized for the express purpose of aiding in the war "by guaranteeing the necessary farm help to increase agricultural production." It was clearly seen that the one great reservoir from which to draw agricultural laborers for this emergency was from the ranks of our boys between 16 and 20 years of age. It has been estimated that there are at least 2,000,000 of these young men in the United States, who can and will qualify for this service. They are physically fit, loyal, interested in doing their bit, and most of all intelligent and adaptable to emergency needs. Germany has used thousands of such boys, and the United States can match her two to one. The slogan this year is to be, "Every boy between sixteen and twenty a member of the U. S. Boys' Working Reserve, and every member engaged in some profitable and necessary occupation."

Last year thousands of city boys were sent to farms over the country in an effort to supply needed labor. These boys went out under unfavorable conditions of placement and supervision, without training, and for the most part without knowing anything of the demands to be made upon them in their work as farm laborers. It is surprising that so large a percentage of these boys made good. This year the Reserve expects to benefit by the more or less unorganized efforts of last season and with a view to increasing the efficiency of the work, some very interesting schemes of organization and administration have been developed. In some states intensive training camps are being established, "Farm Plattsburg," where the boys are to be brought together for from ten days to two weeks of intensive training in the fundamentals of farm work before being sent to the farmer for actual service. After the period of training has been completed the boys are to be sent out in groups of from twenty to thirty to work in a given community under the supervision of

a competent boy leader. In some cases the group is to work out from a farm camp but in many places the boys are to live in the homes of the farmers.

Many states have not seen their way clear to establish and maintain the rather expensive farm training camp, preferring to carry on such training thru the already established training agencies. Such is the case in Illinois, where an effort is being made to enroll young men in preliminary training courses to be conducted in the high schools of the state. Such training courses will be of a very practical nature and it is thought they will introduce the city boy to many of the essentials of farm life and farm work. In this connection they will be taught to care for horses and other farm animals; and to adjust, operate, and repair common farm machinery. Such courses are intended not only to aid in making adjustment to the actual work on the farm, but to afford a foundation for the interpretation and understanding of farm life.

The leaders of this movement have not been deluded by the belief that green city boys can be made to take the place of experienced farm hands. That is not the question. The fact of the matter is that experienced farm hands are not available and will be less and less available as time goes on. The farmer is face to face with a situation which means the utilization of a substitute. Will he accept the services of unskilled, unreliable city transients who have been failures in every other industrial activity, or will he take his chances with an intelligent, interested, vigorous city boy who has had a little insight into the meaning of farm work? The chances are the American farmer will pin his hopes to the young manhood of the country.

There is no question about the response of the American boys to the call to service at this time. Their response means an added responsibility for the schools and for those regularly trained for and engaged in the work of supervision and leadership. The boys who leave the city to assume their duties as farm laborers are for the most part unaccustomed to full personal responsibility. They are leaving the home influence, entering a new and strange home and environment, and the readjustment called for should be made only under careful supervision. In the first place this supervision should mean placement in the

right kind of home. In the second place it should mean increased possibilities for efficient service. Furthermore, the right kind of supervision should insure an intensive and vital educational reaction to the life in the rural community.

(For more information, write to The U. S. Boys' Working Reserve, 120 West Adams St., Chicago, Ill.)

INSTITUTIONS SELECTED TO TRAIN INDUSTRIAL TEACHERS.

THE Manual Training Magazine has carried on quite an extended correspondence during the past two months in order to be able to give to its readers a list of the institutions designated in the several states to train industrial teachers under the regulations of the Smith-Hughes Vocational School Law. Quite a number of states have not made a choice of institutions. The following is the result of such correspondence:

Arizona:

University of Arizona, Tucson.

California:

Los Angeles State Normal School, Los Angeles, and the University of California, Berkeley, (evening classes only).

Colorado:

Colorado Agricultural College, Fort Collins.

Delaware:

Delaware College, Newark.

Georgia:

Georgia School of Technology, Atlanta.

Idaho:

Idaho Technical Institute, Pocatello.

Indiana:

Indiana University, Bloomington.

Indiana State Normal School, Terre Haute.

Purdue University, Lafayette.

Maine:

State Normal School, Gorham.

Maryland:

Johns Hopkins University, Baltimore (Maryland Agricultural College, College Park, and Baltimore Institute, Baltimore, co-operating).

Michigan:

University of Michigan, Department of Engineering, Ann Arbor.

Minnesota:

University of Minnesota, Minneapolis.

Mississippi:

Mississippi Agricultural and Mechanical College, Starkville; Alcorn Agricultural and Mechanical College, Alcorn (for colored teachers).

Nebraska:

University of Nebraska, Lincoln.

New Hampshire:

New Hampshire College of Agriculture and Mechanic Arts, Durham.

New Jersey:

State Agricultural College, New Brunswick.

New Mexico:

New Mexico College of Agriculture and Mechanic Arts, State College.

New York:

State Normal School, Oswego.

State College for Teachers, Albany.

State Normal School, Buffalo.

Board of Education, Rochester.

North Carolina:

North Carolina State College of Agriculture and Engineering, West Raleigh.

Ohio:

University of Cincinnati, Cincinnati.

Ohio State University, Columbus.

(Institutions in Cleveland and Toledo are likely to be approved by the State Board later).

Oklahoma:

Oklahoma Agricultural and Mechanical College, Stillwater.

University of Oklahoma, Norman.

Oregon:

Oregon Agricultural College, Corvallis.

South Dakota:

South Dakota State College of Agriculture and Mechanic Arts, Brookings.

Texas:

University of Texas, Austin.

Agricultural and Mechanical College of Texas, College Station.

Prairie View State Normal and Industrial College, Prairie View (for colored teachers).

Utah:

School of Education of University of Utah, Salt Lake City.

Vermont:

University of Vermont and State Agricultural College, Burlington.

Washington:

University of Washington, Seattle.

West Virginia:

West Virginia University, Morgantown.

Wisconsin:

Stout Institute, Menomonie.

Wyoming:

University of Wyoming, Laramie.

MORE CIVILIAN WORKERS NEEDED.

THE U. S. Ordnance Department is calling for more civilian workers. Men having (a) a high school education, (b) some shop training, and (c) the natural ability to adapt themselves to new work, may qualify for a Government appointment in which, under Government instructors, they will receive the necessary training for such positions as the following:

Inspectors of gun carriages and parts, of gun fire control instruments, of motor vehicles and artillery wheels, of ammunition packing boxes, of field artillery ammunition steel, of artillery ammunition, etc., also engineers to make tests of ordnance materials and machinists who are accustomed to work to thousandths of an inch.

These positions are under civil service regulations, but applicants are not required

to report at any place for examination. Each applicant will be rated in accordance with his education and general experience. Applications should be sent to C. V. Meserole, special representative of the U. S. Ordnance Department, Room 800, 79 Wall St., New York City.

POSTPONED

FOR patriotic reasons, the St. Paul meeting of the Western Drawing and Manual Training Association has been postponed for one year. The thought behind the decision is that by keeping even a small amount of passenger and freight traffic off the railroads the Association will be helping along the war work to some extent. The officers state that the work of the Association will not stop, and that plans are under way to conduct some of it by mail.

The Eastern Arts Association will hold its meeting in New Haven as announced on April 4th, 5th and 6th, but its exhibit will be limited to what can be carried in a hand bag.

WASHINGTON CORRESPONDENCE.

GOVERNMENT POLICIES INVOLVING THE SCHOOLS IN WAR TIME.

TWO outstanding events of the month were the announcement of a statement which had been prepared in Washington outlining government policies involving the schools in war time, and the organization by the War Department of a committee on educational problems.

School officials in all parts of the country have been asking the Commissioner of Education and others for advice as to what the schools should do to render the utmost service of which they are capable during the war emergency. Many demands

have been made upon the schools, and many proposals for service of various kinds have come from those who would use the schools to accomplish their ends. In some cases superintendents and principals have been subjected to criticism as being only lukewarm in their patriotism because they have not responded enthusiastically to all these demands.

With admirable loyalty and patriotism, the schools stand ready and eager to do their full duty, whatever that may be, but great need has been felt for some authoritative statement which should make the path of duty and service plain.

CONFERENCES IN WASHINGTON.

IN response to the conviction that the time had come for the formulation of a definite statement which might have the weight of a government announcement of policy with reference to the schools in war time, Secretary Lane early in February took the initiative in calling a conference of representatives of the several Departments at Washington most directly concerned, for the purpose of considering the matter. These included the War Department, the Navy Department, the Department of Agriculture, the Department of Labor, the United States Civil Service Commission, and the Department of the Interior thru the Bureau of Education.

As the result of this conference a preliminary statement was prepared and submitted again to conference a week later. In addition to the representatives of the Departments, there were present at the second conference four state superintendents of public instruction and eight prominent city superintendents of schools, summoned to Washington by telegraph. The revised statement was signed by the Secretary of War, the Secretary of the Navy, the Secretary of the Department of the Interior, and the chairman of the Civil Service Commission. On account of absence from their offices it was not possible to obtain the signatures of the remaining Department chiefs before the statement was made public in Atlantic City on Tuesday, February 26th.

ENDORSED BY DEPARTMENT OF SUPERINTENDENCE.

ON Tuesday afternoon the statement was presented at a meeting of the National Council of Education in the auditorium of the public high school in Atlantic City, and enthusiastically approved. Later in the week, upon the recommendation of the committee on reso-

lutions, the report was endorsed by the Department of Superintendence.

The statement included a brief outline of the most pressing needs as seen by each Department concerned, together with some indication of the possible relation of the schools to these needs, followed by a summary of conclusions and recommendations. For lack of space, only the summary can be given here.

CONCLUSIONS AND RECOMMENDATIONS.

1. Conditions in different sections of the country are so diverse that no detailed policy will be uniformly applicable. Only general policies and principles may be adopted for the country as a whole.

THE ELEMENTARY SCHOOLS.

2. There appears to be nothing in the present or prospective war emergency to justify curtailment in any respect of the sessions of the elementary schools, or of the education of boys and girls under 14 years of age, and nothing which should serve as an excuse for interference with the progressive development of the school system. Teachers and pupils may be encouraged to find ways of performing some service having war value, such as activities connected with the Junior Red Cross, War Garden Work, Boy Scouts, War Thrift Work, and the like. Opportunities should be found to introduce into the school, activities having real educational value, which at the same time link up the schools with the ideals of service and self-sacrifice actuating our people, and bring home to the consciousness of teachers, pupils, and parents the essential unity of the nation in this great crisis.

3. In the country and villages, all girls under 14 years of age, and all boys under 12, might well continue in school thru the summer, wherever the condition of the school funds makes this at all possible.

4. In the cities, there would be no interference with the supply of needed labor if all children under 14 continue in school to the end of the regular session, and thru the summer as well; and there would be but little interference if all children under 16 continue in school.

THE SECONDARY SCHOOLS.

5. One of the places in which there appears to be immediate demand for modification of the high school program is in respect to the

need for agricultural labor. Much valuable service can be rendered by carefully selecting and training boys to assist in meeting this demand. It cannot be too strongly urged, however, that each pupil's case be considered individually, and no pupil should be excused from school for this purpose except with the written consent of the parents, to accept specified employment for a definite term, under responsible supervision by the school or by other approved agencies of the conditions of employment.

6. It would be helpful in cities, and especially in industrial communities, if for boys and girls over 14 years of age in or out of school, there could be introduced certain definite courses looking toward a co-operative half-time plan of school attendance and employment thruout the year.

IN GENERAL.

7. In general, it is believed that wherever school boards can find the means, the present emergency is an opportune time for readjusting the schools on an all-year-round basis, with a school year of 48 weeks, divided into four quarters of 12 weeks each. The schools would then be in continuous operation, but individual teachers and pupils would have the option of taking one quarter off at pre-arranged periods for needed change.

8. If it is not practicable for the schools to change at once to the all-year-round program, a much-needed service can be rendered in many localities by organizing special summer and evening classes to train young people for the civil service, and to train stenographers, typewriters, clerks, and secretaries for the commercial world. In many communities will be found numbers of adult women who are free to avail themselves of special training to fit for various kinds of positions in office and clerical work, taking temporarily the places of men called to the colors or to other employment.

9. Some schools should consider the possibility of arranging a schedule for certain groups of students having a definite prospect of service, in accordance with which the summer months would be spent in school, leaving the students free to work on the farms during planting time in the spring and again during harvest time in the fall. In still other cases, particularly in the smaller communities, time may be secured for farm work by omitting the usual spring vacation, by holding school

on Saturdays, and otherwise speeding up, and thus completing the term's studies some weeks in advance of the usual date for closing the school.

10. Special programs of the type suggested in the preceding paragraph, should be reserved in general for individual students or specially selected groups of students who have definite plans for proper use of the time thus taken from school. In no case can justification be found for the general shortening of the school term in the expectation that *some* students *may* find places of useful service.

11. In response to definite requests from government agencies, schools should be used from time to time for specific preparation of individuals for immediate service.

12. Boys and girls should be urged, as a patriotic duty, to remain in school to the completion of the high-school course, and in increasing numbers to enter upon college and university courses, especially in technical and scientific lines, and normal school courses, to meet the great need for trained men and women.

COMMITTEE ON EDUCATION AND SPECIAL TRAINING.

THE War Department has organized a committee on education and special training to supervise the instruction which it is proposed to give to certain units of conscripted men during the next few months. The committee consists of one representative each from the general staff, the provost-marshal general's office, and the adjutant general's office. To assist the committee an advisory committee has been formed consisting of the following persons: Dr. C. R. Mann, Massachusetts Institute of Technology; Dr. James R. Angell, University of Chicago; J. W. Dietz, president, National Association of Corporation Schools; James P. Munroe, chairman of the executive committee, Federal Board for Vocational Education; Dr. S. P. Capen, specialist in higher education, U. S. Bureau of Education.

In accordance with plans formulated by the board, a careful inspection was made

during the week beginning February 17th of a selected list of schools having facilities for technical training in the eastern and middle western sections of the country. The inspection was made by army officers, accompanied by field agents of the Federal Board for Vocational Education, with the assistance of a number of specialists borrowed for the purpose.

VOCATIONAL TRAINING FOR CONSCRIPTED MEN.

THE details of the plan have not been determined at the time this is written. It is proposed, however, to utilize the facilities of schools located in 17 or more cities to accommodate an initial assignment of 10,000 men to begin training on or about April 1st. The length of the training course is to be two months, eight hours daily, under the usual conditions of army pay and allowance for subsistence.

As soon as the plan is well under way, it is intended to expand as rapidly as possible, with the hope of providing two months of special technical training for a greatly increased number of men by October 1, 1918. The first assignments will be of men needed in the aviation service, and will include air-plane mechanics, automobile mechanics, machinists, woodworkers, and others.

TRAINING FOR DISABLED MEN.

THE Federal Board for Vocational Education has called attention to the fact that before the end of the coming summer the tide of wounded American fighting men will be returning from Europe, and has emphasized the imperative need of congressional legislation authorizing the establishment of an adequate system for the rehabilitation of these men.

In estimates submitted to Congress the board shows that out of 1,000,000 soldiers in the expeditionary forces, probably

100,000 will be returned during the first year of fighting, and that instruction in new lines of industry will be needed for at least 20,000 who will be physically unable to return to their previous occupations.

CLASSIFICATION OF DISABLED MEN.

THE disabled are divided by the board into four classes: Those permanently invalided; those able to work, but who cannot engage in competitive occupations; those who must learn new occupations because of their physical handicaps; and those able to return to their pre-war tasks. About 80 per cent. are expected to fall into the fourth class, and the remainder, with few exceptions, into the third.

For the 20 per cent. who must take up new occupations, there has been drafted a plan of general education, elementary vocational instruction, and, finally, specialized training in the calling to which the man is best adapted.

To take charge of the vocational re-education of the disabled the Federal Board recommends the immediate training of teachers of occupational therapy, estimating that 1,200 instructors will be needed at home for every million of fighting men overseas. The greatest need will be for those competent to teach general educational and commercial subjects, manual training, mechanical drawing, drafting, and handiwork in the arts and crafts. The emergency training course proposed would cover eight weeks.

Methods of organizing, financing, and administering a national scheme of rehabilitation are discussed in a report submitted to the U. S. Senate on January 29th. The project involves the establishment of a central administrative headquarters in Washington to co-ordinate the work of federal, state, and community agencies thruout the country.

OPEN QUESTIONS

"There is more to be said on this subject."

MANY KINDS OF WORK OR FEW.

Mr. Editor:

For several months the matter of teaching many kinds of work in public school shops rather than a few only, has been discussed in the "Open Questions" department of the *Manual Training Magazine*. The purpose of this letter is to point to a goal, towards which industrial arts instruction seems to be tending, and apparently must tend in the years just ahead of us. This tendency is in the direction of offering an acquaintance with a variety of industrial occupations as a part of the program of the junior high school, enabling a boy to find himself and helping him somewhat in choosing his future occupation.

Students of educational practice today seem generally agreed that good instruction in wood-work and drawing requiring high standard of workmanship, should have a permanent place in the usual elementary and secondary schools. Many are agreed that metal work of some kind should be added in the later years of the regular high-school program. With adequate time concentrated upon a few shop subjects, considerable special skill may be developed, and this skill is a desirable addition to any boy's equipment for life.

There is no reason to object to such work, but there are also reasons for advocating work of an entirely different character. The introduction of many kinds of work is not proposed for the development of a considerable degree of skill in each of several mechanical trades. It is urged, however, for an understanding of the elements of several trades while carrying on regular school studies. In every case it is advised that sufficient time be provided for each subject for a grasp of its meaning, for a detailed analysis of selected phases of it, and for practice in certain of its operations.

In recommending a variety of work in industrial arts for boys in the seventh, eighth, and ninth grades, it is assumed that an important purpose in those grades is that of suggesting adult activities. Many of these activities may be selected from well recognized occupations, especially in the field of industry. Schools are adjusting themselves to the practical needs of the times by giving over more

and more of their efforts to teaching subjects which will be of immediate use to graduates upon leaving school. The selection of the most necessary practical activities is a difficult problem, but it must be undertaken. The teacher of industrial arts may be a large factor in solving the problem.

If we grant that an understanding of the nature of typical occupations is desirable for the boy of sixteen years of age, we must also grant that this understanding should be acquired thru experience, as far as possible. While it is impossible to give this varied experience in the commercial and industrial world itself, it is possible to furnish certain of the more common experiences within the school building, where samples of industrial occupations may be easily provided.

In order to accomplish this purpose it is desirable to have several small shops equipped with tools, machines, and benches, selected for this particular use, with school limitations and industrial needs both in mind. It is also practicable to combine two or more of such shop equipments in one room, and this arrangement is to be preferred in smaller communities, where one teacher will handle more than one subject. Such equipments need not be expensive, as they are concerned largely with the simpler processes in each subject, and usually for small numbers of students in each section.

After several years of experience in trying out the teaching of a variety of shop subjects for boys from twelve to sixteen years of age in the public schools of Menomonie, Wisconsin, with special teachers and thoroly equipped shops, I am convinced that such work has an important place to fill in American public schools. Each subject in Menomonie is offered for an hour and a half per day for forty-five days. This makes four subjects per year, and sixteen subjects in four years in the Menomonie schools.

Thru co-operation with Stout Institute, four courses are offered in drawing, and the following twelve shop courses from the seventh to the twelfth grades: carpentry, joinery, plumbing, bricklaying, painting, forging, printing, wood-turning, cabinet making, pattern making, foundry work, machinist's work. Other subjects might be substituted for any of these,

but at the present time these are most feasible in Menomonic, and all of them seem worth while. They could all be taught with far less equipment than that available at Stout Institute.

In presenting instruction for boys taking these vocational acquaintance courses, the first attention should be given to the manner of using tools and of fitting parts of constructions, with insistence upon good workmanship. Some part of each course should include projects requiring repeated drill and practice upon certain operations typical of modern industry. These operations, however simple, should show the demand for standardization of parts in commercial practice, the adoption of special shop kinks, the use of jigs and automatic devices, and the development of uniform motions in working operations with the attainment of adequate speed.

As one of the aims in the work just described is to give a familiarity with vocational activities, other tools and types of work should be demonstrated besides those to be undertaken by the boys themselves. The instructor should present such phases of each industry as are most general and most readily illustrated. Related information regarding materials used in the industry and schemes of construction most frequently employed should be given a reasonable share of the time of the course.

During the progress of the work, lectures, readings, and visits to industrial plants should be scheduled so as to give a survey of working conditions, wages, opportunities for advancement, and other vocational information.

A final word should be said in answer to the statement that such work is concerned only with beginnings in many fields and therefore cannot assure a proper understanding or proper execution of work. If the work is well organized and systematically presented, the opposite should be true. Only the more significant matters should be given a place and the boy's grasp of such instruction should be frequently tested. Good standards of execution should be the constant rule.

In the choice of many kinds of work rather than few, it is evident that aims must change. Two of these conflicting aims must be kept entirely distinct: intensive aims concentrated upon few subjects for the development of skill, and extensive aims spread over a variety of experiences for vocational acquaintance. There are good reasons for the introduction of

either intensive or extensive work, but their purposes and contents should not be confused.

—G. F. BUXTON.

A COLLEGE DEGREE WITH TECHNICAL TRAINING.

Dear Editor:

I have been very much interested in the discussion on "First Aid Courses." The title used in the February issue, "A College Degree or Technical Training and Teaching Experience" has possibilities of modification. I should make it read, "A College Degree With Technical Training."

Teaching experience is always desirable, but cannot be expected of the man who has just completed his course, unless practice teaching is considered. Technical training, however, can be had by degree men if we are willing to set aside some traditions, and recognize the need of special emphasis upon technical work for the prospective teachers of technical subjects. We need to make clear to school officials who employ teachers, and to our faculties in teacher-training institutions (a) that a very broad field is covered by the shopwork now done in our schools, and that any one line may be a trade in itself, requiring long years to master, and (b) that a teacher who has spent four years in college with permission to elect from 15 to 40 semester hours credit of technical work out of the total 120 required for a degree cannot master the whole realm of modern industry. We need to insist that a man who is to teach drafting, have opportunity to become a good draftsman even tho he may sacrifice some of the customary prerequisites of the usual college degree. He should get thorough knowledge of drafting-room procedure, and such ability in actually doing the work as would entitle him to the respect of draftsmen in industry; he should have an adequate basis of related shop experience, mathematics, and science to handle drafting-room problems intelligently. He should have the theory of teaching and sufficient practice to have more than a fair chance of success. He might not have had ancient or modern language, but his worth would not suffer thereby.

The time is not far distant when such an analysis of the lines of technical subjects now taught will be found worth while, and when a prospective teacher may find courses planned to give him adequate technical training, an ability to do the work he pretends to be ready

to teach, and to grant him a degree when the course is completed. —ALBERT F. SIEPERT.

HOW MANY PERIODS A DAY?

Dear Mr. Editor:—

I have noticed Mr. Boyce's question in the January number and I feel sure that most schools are not inclined to consider manual training as being on a different plane from the other school subjects. Here in Evansville, there is no distinction. In fact, it has been expressly stated in meetings of the Board that manual training men in charge of machines deserve at least \$50 more a year than other teachers. Some of my teachers have to teach more than six periods, but in other ways they are relieved from responsibilities which would make up for the difference. Teachers of science who have laboratory work also have more than six periods of school work.

The North Central association makes some exceptions in favor of manual training teachers in respect to college degrees. This helps some men but not others.

I believe that Mr. Boyce is right in saying that the mental strain of teaching manual training properly is as great as that in other subjects. But I do not believe there is much of a tendency to discriminate against us on that score.

In the movement for a longer school day there is likely to be an increase in the length of the shopman's day.

I believe manual-training men should help themselves more by not permitting boys to work overtime on class work. Some schools almost double the teachers' time by encouraging after-school work. This also hinders the spread of the movement for a better time allowance for manual training. In cities where boys can get a chance to work after school and on Saturdays, the product of their work does not fairly represent what they would do in the short periods of regular school work.

Manual Training men sometimes permit school authorities to load them down with outside work. This is working more of a hardship than is generally known. We are not

free from it here, and I admit that it is largely my fault. But I have tried to make up for it by getting extra pay for pupils and teachers on this work.

Evansville, Ind.

—EUGENE C. GRAHAM.

WOODWORK FOR COUNTRY BOYS.

Mr. Editor:

In answer to "O. H. L." I would suggest that boys who have never had woodwork should start with the beginning work even tho they are in the high school. They can usually do this elementary work more rapidly than the grade pupils can, and some of it may be omitted. This omitting should, however, be done with care. Each fundamental part of the work should be well mastered before advancing to the next.

Work that is suited to eighth-grade town or city boys should be satisfactory for the country boys, especially if in presenting the work, suggestions are given, showing how similar methods of construction would be applied in farm problems. If to any project you have for city boys you apply the test, "Is it ever useful in the country?" you will find that few of them are really inappropriate for country boys. This idea of "Farm models for farm boys and city models for city boys" is overworked. The way the work is given is far more important than what models are used.

The slow-but-sure habits of work are common characteristics of country boys, but you should take every opportunity you can to develop speed by directing their methods of work.

—C. S. V. D.

HOW CAN I REFINISH GOLDEN OAK?

Mr. Editor:—

Occasionally a boy comes to me with a request to refinish a golden oak, varnished surface by removing varnish and restaining with a darker fumed-oak stain. We have not been able with varnish remover to open up the pores of a varnished surface to the point where a darker stain can be applied with complete success. Will someone who knows how this can be done, kindly impart their knowledge to others thru the *Open Questions* department?

—E. H. P.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

CABINET PHONOGRAPH.

THIS project was one of the fine pieces of work produced in the classes in woodwork design and in furniture making at Bradley Institute last year. The construction is possible for the better workmen among high school boys, but extremely careful workmanship is demanded. The case is made of selected black walnut finished so as to bring out all the softness and beauty of the wood. The decoration is hand-carved, while the sound openings are cut from $\frac{7}{8}$ " stock on an ordinary circular saw. The corners are mitered, and offer an unusually severe test of ability. The sectional drawings indicate the arrangement of the interior. The sounding box, made of red spruce, was built in three sections and then assembled before being put in place. Care must be taken to have the inner surfaces smooth, and all joints tight. The motor and remaining parts of the machine were purchased ready for installation. This piece was designed and made by hand-tool processes by Richard Royster, now in the U. S. Service and located at the Great Lakes Naval Training Station.

CUPBOARD.

This drawing is reproduced with but slight modifications from an examination problem in woodwork design at Bradley Institute. This, also, is the work of Mr. Royster. The piece has not been constructed, but should be a good project for the shop equipped with woodworking machinery suitable for doing paneling.

CHECKER-BOARD TABLE.

The following is quoted from *Vocational Education Letter No. 23*, sent out by the U. S. Bureau of Education:

Directors and instructors of manual training in all parts of the country have expressed a desire to be allowed to organize their shops and students so as to make some tangible and useful contribution in the war emergency.

As the result of numerous suggestions, and after conference with the appropriate committees, the Commissioner of Education is au-

thorized to announce that the Army Young Men's Christian Association will be glad to accept gifts of checker tables from manual training schools or departments. The Associa-



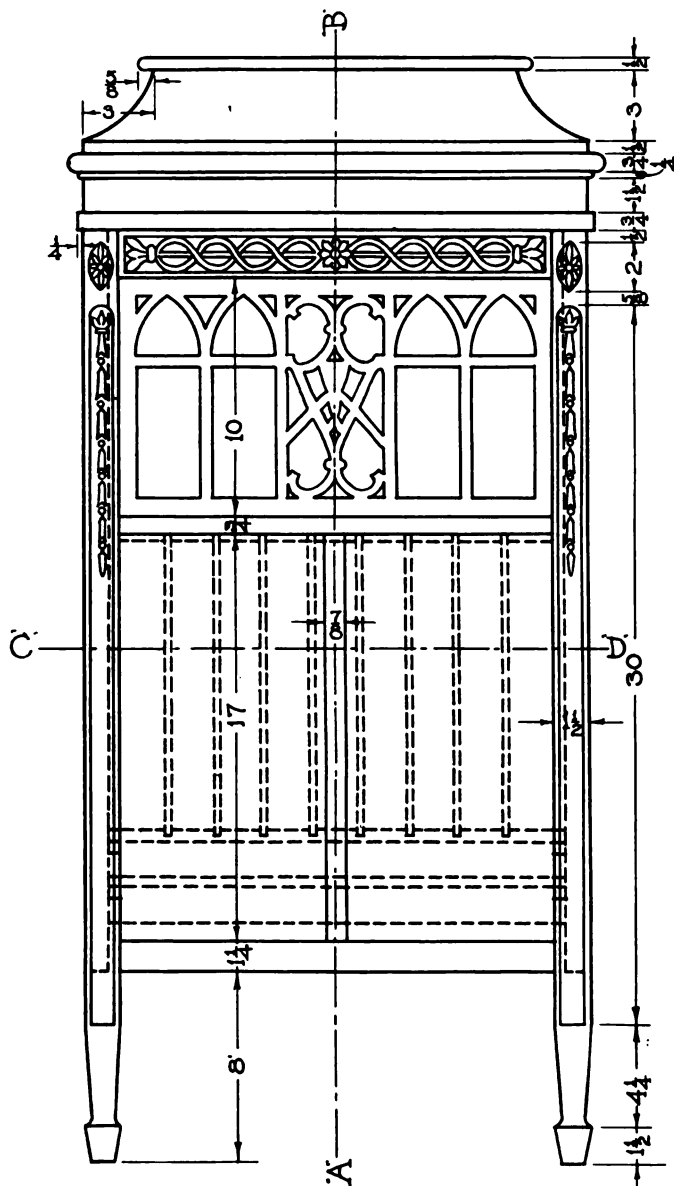
tion is not able to pay for materials, but will pay freight charges if tables are packed and shipped in accordance with directions to be furnished later.

There are 32 Army cantonments, with a total of 500 Y. M. C. A. buildings already erected or projected. Each of these buildings can use to advantage from 8 to 10 tables; a total of 5,000 tables.

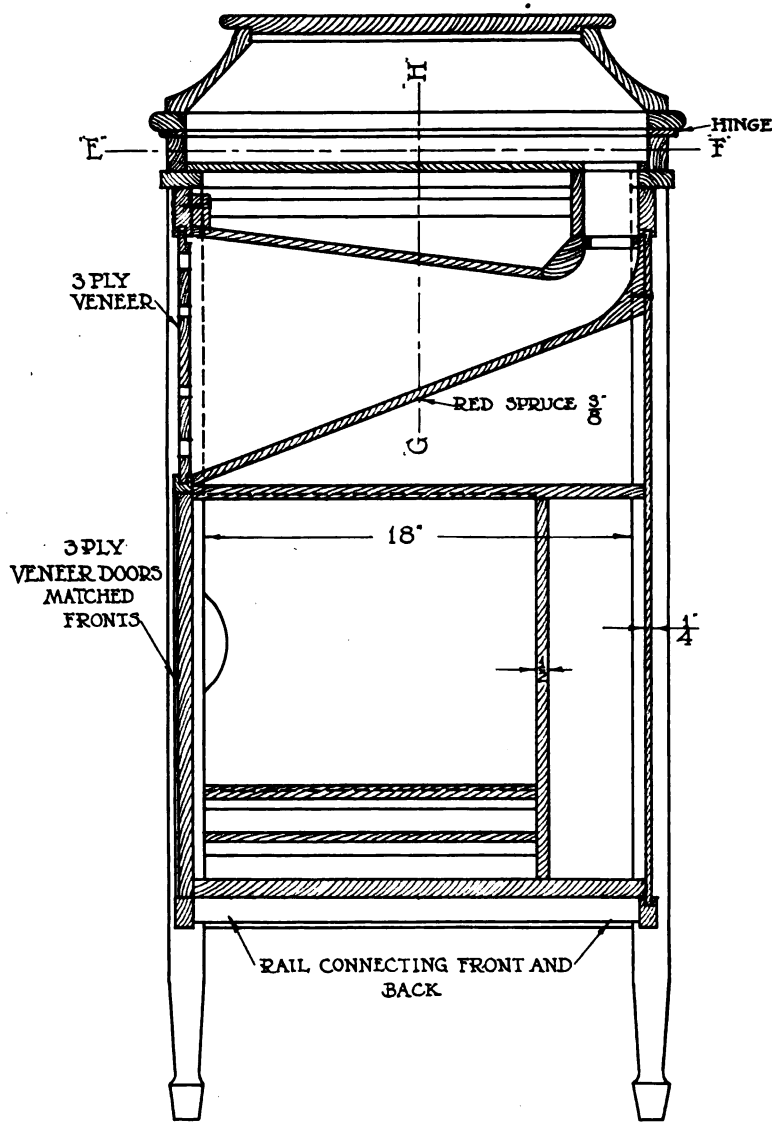
It is hoped that several hundred schools or departments will be able to meet the requirements outlined below, and willing to do-

CABINET PHONOGRAPH. ADAM STYLE

1' 0' 1' 2' 3' 4' 5' 6'

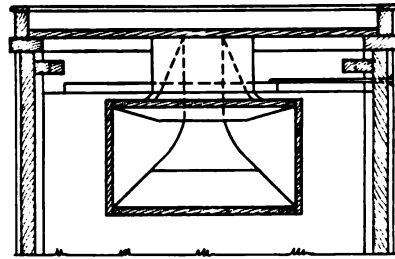


CABINET PHONOGRAPH
SECTION ON A-B

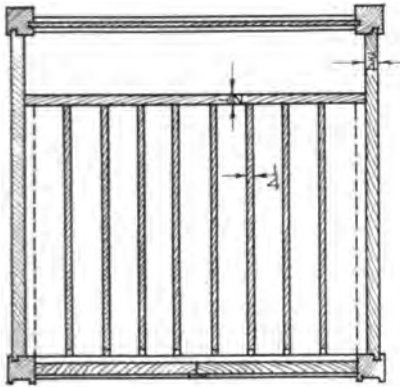


CABINET PHONOGRAPH DETAILS

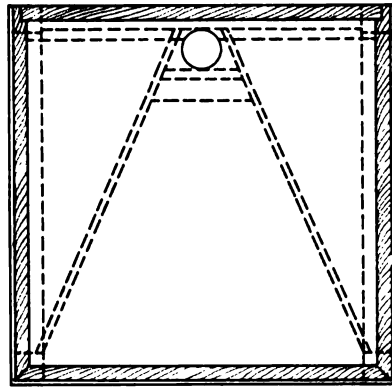
1' 0" 1' 2" 3" 4" 5" 6"



SECTION ON G-H



SECTION ON C-D



SECTION ON E-F

nate the materials and labor, and furnish from one to ten tables per school for this worthy purpose.

Superintendents of city school systems, or directors of manual training departments who can do so, are requested to write a letter to the Commissioner of Education in the following form:

Commissioner of Education, Washington, D. C.
DEAR SIR:—Referring to Vocational Education letter No. 23:

The manual training department of the will
(Name of school.)

undertake to donate material and labor and to furnish tables, packed and delivered to carrier, ready for

(Number: One to ten.)
shipment to the Army Y. M. C. A.

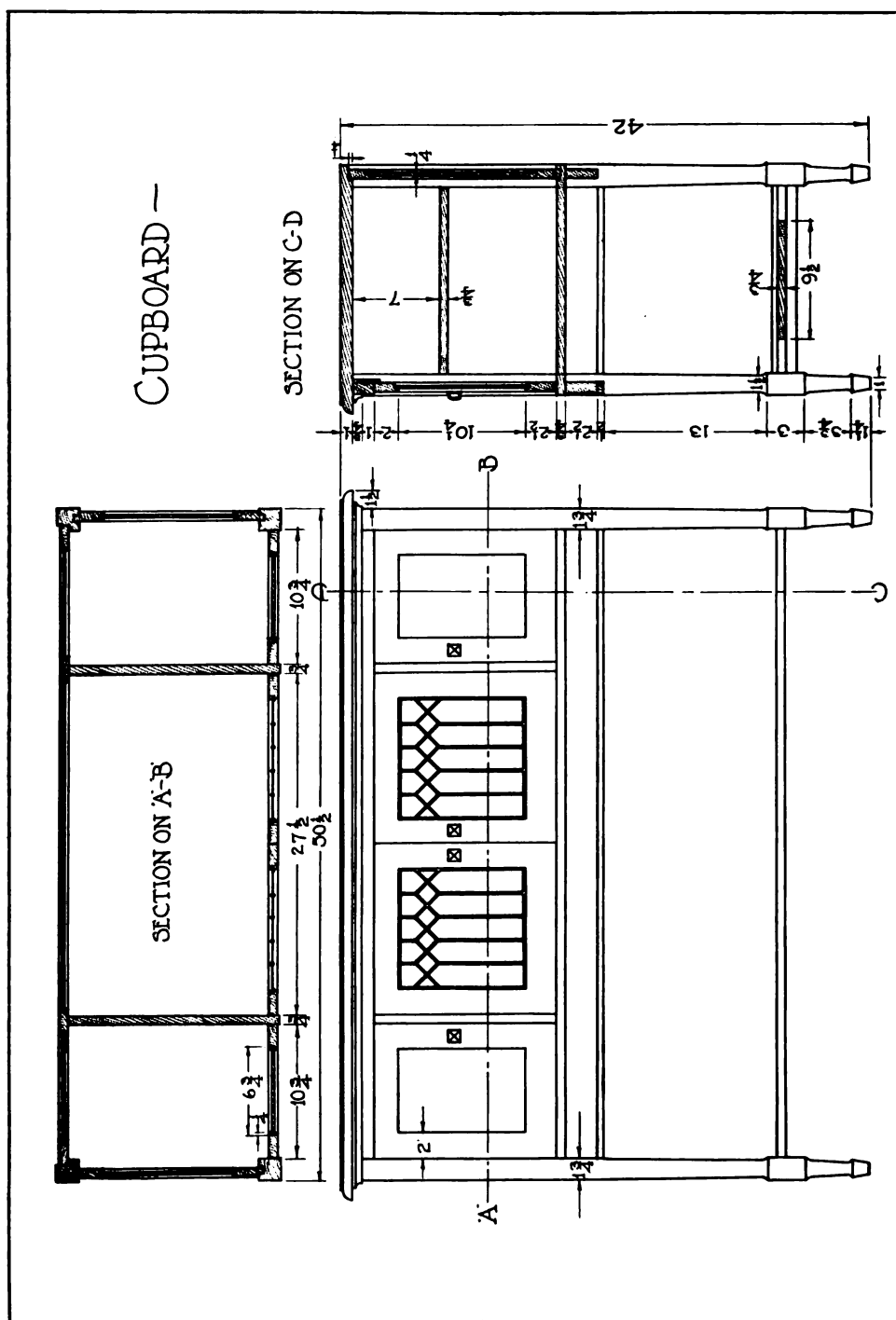
We are prepared to guarantee materials, construction, and finish according to specifications, and expect to have the tables ready for delivery about
(Signature.)

SPECIFICATIONS.

See working drawing on page 293, prepared from design submitted by Prof. Ira S. Griffith, University of Missouri, Columbia, Mo.

Materials.—The table should be constructed of hard or yellow pine, clear, and thoroughly dry; top and rails, stock thirteen-sixteenths of an inch thick; legs, stock 1½ inches square.

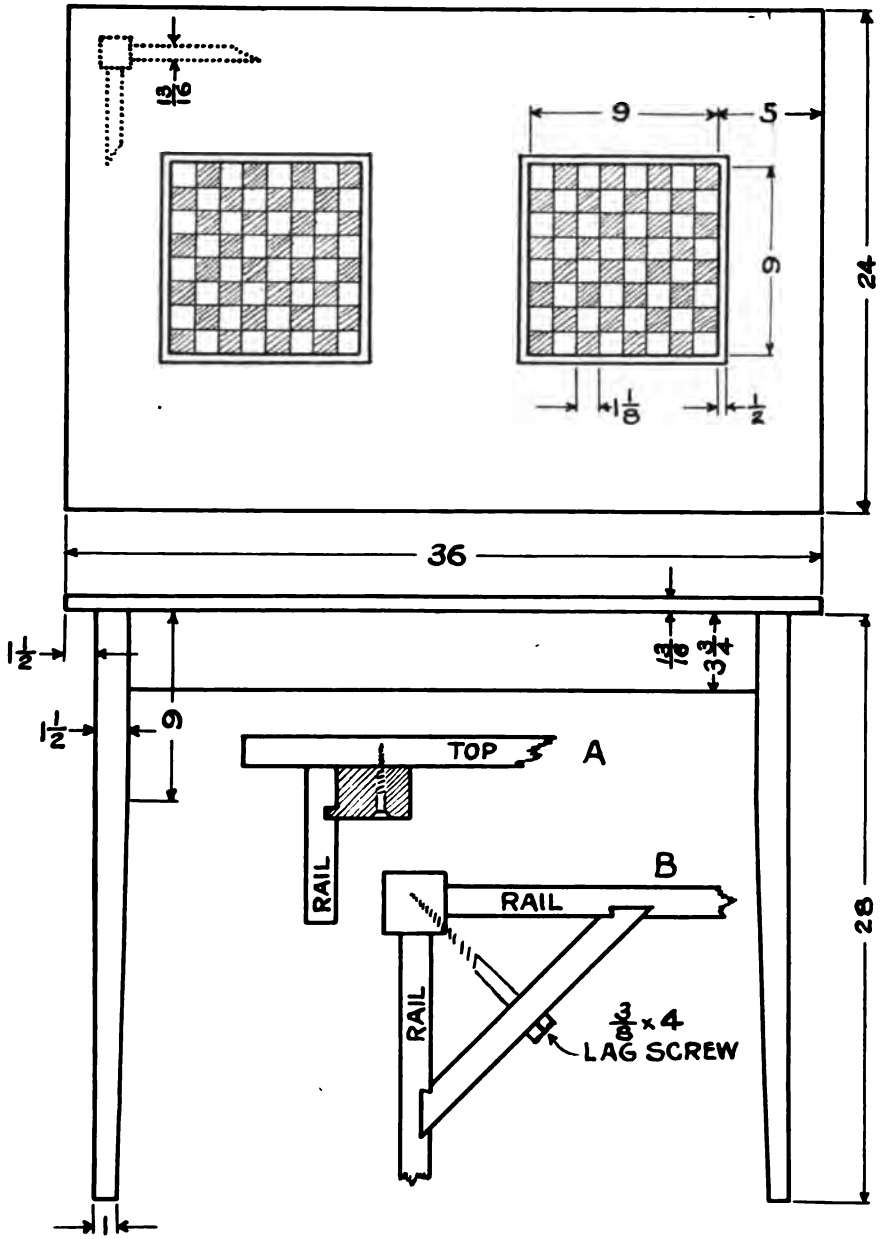
Construction.—At the camps the tables will necessarily be subjected to hard usage. None but the most accurate and thorough construction should be permitted. Although the table is of simple design, its construction should not be undertaken by beginners. Only skilled workers should be detailed to this task.



DEPT. OF THE INTERIOR
BUREAU OF EDUCATION

WASHINGTON
JAN. 1918

KNOCK-DOWN Y.M.C.A. GAME TABLE



The top should be glued up, using at least three pieces; joints doweled, or tongued and grooved.

Rails are fastened together by corner braces, dovetailed and glued in place, as shown at "B" in drawing.

Rails are fastened permanently to top, using small tongued blocks, as shown at "A." Use at least six blocks. If preferred, rails may be fastened to top with metal plates.

Legs are bored and secured to rails, butt joints, by means of lag screws, or stair rail bolts, as shown at "B." Legs are tapered on two sides only (inside edges), beginning at 9 inches from top.

Finish.—(1) Carefully sandpaper all over.

(2) One coat white shellac.

(3) Paint in checker-board designs in black and red shellac, with $\frac{1}{2}$ -inch gold paint border.

(4) Two coats best quality flat varnish. Sand each coat lightly with No. 00 sandpaper.

(5) Name of school may be indicated by attaching small metal plate to end rail.

Packing.—(1) Knock down, by removing lag screws.

(2) Wrap legs and screws, and pack between rails, fastening temporarily in place with small cleats.

(3) Wrap with heavy paper or burlap, to protect finish, and pack table in crate.

(4) Attach shipping tag, properly addressed, with tacks. (Full shipping directions will be supplied later.)

NOTE.—Work on construction should begin at once, as soon as letter is mailed to Commissioner of Education. The tables will be of greatest service in the camps during the present cold season. Plans should be made to push the tables through to completion at the earliest date consistent with the highest quality of workmanship.

MANUAL TRAINING EXHIBIT

The accompanying photograph was received from Edward Bodenstein of Newport, Ky. It shows the annual exhibit of manual training in that city. It includes work from the 7th, 8th, 9th, and 10th grades. The clock is the work of a first-year high school boy. It is made of solid mahogany; it contains a chime movement that plays at every quarter-hour.



ANNUAL MANUAL TRAINING EXHIBIT, NEWPORT, KY.

CURRENT PUBLICATIONS

Our Schools in War Time—and After, by Arthur D. Dean, Ginn & Company, Boston, 1918. Size, $7\frac{1}{2}$ " x $5\frac{1}{4}$ "; 335 pages and 14 pages of half-tone illustrations; price, \$1.25.

It would be impossible to find a more timely book on education than this volume. It discusses war work of all sorts in all types of schools; it reveals many educational opportunities not generally recognized in war work; it gives a chapter to Red Cross and other community work, and two chapters to farm cadets and cadet camps; it treats also of the re-education of the disabled soldier.

It has been written out of a rich teaching and administration experience in industrial education, a thoro study of the effect of the war on the schools of England and France, and with a vision of the future that is in harmony with American ideals and aspirations. Dr. Dean says that "It remains for America to use the war to make better schools," and then he points out the way.

The style of the book is admirably suited to its purpose.

The Vocational Guidance Movement, by John M. Brewer, Los Angeles State Normal School. The Macmillan Company, 1918. Size, $7\frac{1}{2}$ " x 5"; 333 pages; price, \$1.25.

This will be especially valued as a constructive summary of the discussion of vocational guidance in form well suited for a college or normal school textbook.

After presenting the problems of vocational guidance and its historic beginnings, the book shows the relation of vocational guidance to vocational counseling. Then, under the title "Pseudoguidance," the author enumerates and discusses "questionable practices in attempted vocational guidance." Some of these are, (1) belief in the unproved theory that there are fixed and well-marked types of mind; (2) overestimation of what psychological tests can at present do; (3) belief that qualities of mind are general and transferable, rather than specific; (4) overestimation of the importance of physical characteristics; (5) the encouragement of morbid self-examination; (6) overguidance; (7) commercial agencies; (8) lack of perspective; (9) control of vocational guidance by other departments or by non-educational organizations.

The book ends with "a program for vocational guidance" in which the author discusses (1) the types of schools needed; (2) the function of the school people; (3) co-operative effort for vocational guidance; (4) the improvement of the conditions of employment; (5) methods of guidance; (6) training in vocational guidance; (7) some appropriate next steps.

In the appendix is to be found a special glossary, a comprehensive bibliography and questions on each chapter.

Minnesota Course of Study and Manual for Teachers, by Theda Gildemeister, teacher of methods, at Winona Normal School. Published by the State Department of Public Instruction, St. Paul, Minnesota. Size, 9 x 6 in.; 303 pages; price, in paper covers, 50 cents.

Teachers in normal schools and supervisors who have to solve problems of correlation and adjustment, will find in this course of study many suggestions. The author has sought to make the best selection of subject-matter, and to recognize the present-day tendency toward an enlarged and varied, tho unified course of study. The book gives space to industrial arts, vocational guidance, drawing and moral training, as well as to geography, arithmetic, and other elementary school subjects.

Elementary Forge Practice, by Robert H. Harcourt, instructor in forge practice at Leland Stanford Junior University. Published by Stanford University Press, Stanford University, California, 1917. Size, $7\frac{3}{4}$ " x $5\frac{3}{4}$ "; 148 pages; price, \$1.50.

More completely than any previous book on this subject that we have examined, this book shows by means of carefully prepared line drawings, the steps in the production of typical pieces of forge work. For this reason, if for no other, this book will commend itself to teachers and students alike. But it is also a well-graded course of study in the fundamentals of forging. Besides being a course of study, it is a textbook on materials, tools, other equipment; on the use of heat and the fundamental processes of forging; on annealing, hardening and tempering steel; and on tool forging.

It is suitable for use in technical, high, vocational, and engineering schools.

Course of Study in Manual Arts for the Public Schools of Porto Rico. Prepared by Frank S. Pugh, supervisor of manual arts. This course is issued as Bulletin No. 5, 1917. Issued by the Department of Education of San Juan, Porto Rico. Size, 7x9¼ inches, oblong; 125 pages.

This course was prepared to assist teachers giving instruction in the schools of Porto Rico, and covers mechanical drawing and wood-work for the seventh, eighth and ninth grades. While many of the problems are familiar, there are several which are not. The course is progressively arranged, and closes with the construction of cabinets, tables, etc. It is pleasing to see that considerable refinement in design is shown in the problems given to the students. In fact, several of the designs are of superior quality.

How the Present Came from the Past, by Margaret E. Wells, Primary Supervisor, State Normal School, Warrensburg, Mo. Published by Macmillan & Company, New York, 1917. 5½ x 7½ in.; 176 pages; illustrated; price, 56 cents.

Book I. The Seeds in Primitive Life. A new note in the teaching of history has been sounded in this unique volume. The history of primitive man is revitalized by dealing with the past in relation to the present and near future, which is indeed a departure from the traditional tracing of his history along political lines.

The first part, covering six chapters, is devoted to the history of primitive man, but it is presented in such a way as to stimulate the child's thinking rather than as a mere presentation of facts. The second part consists of myths and legends, gathered from many sources, which deal with the beginnings of things. Thruout the volume the author has kept her knowledge of the field covered subordinate to her knowledge of and interest in child nature and the objects of education.

In the hands of pupils of the grammar grades this book would provide an excellent foundation for a good high school course in ancient history.

Record Forms for Vocational Schools, by Joseph J. Eaton, director of industrial arts and vocational education, Yonkers, N. Y. Published by World Book Company, Yonkers-on-Hudson, N. Y., 1917. Size, 4¾ x 7¼ in.; 58 pages; price, 60 cents.

This book provides a system of report cards and blank forms for use in vocational schools. The system is intended to eliminate "red tape" and to avoid an extreme amount of record keeping on the part of the teacher. In preparing the book, Mr. Eaton has had the assistance of a certified public accountant and an efficiency engineer, who has specialized in factory work.

Practical Road Building, by Charles E. Foote. Published by David McKay, Philadelphia, 1917. Size, 7½ x 5½ in.; 296 pages; price, \$1.25.

The history and influence of roads together with the part that improved highways can be made to play in our national development are set forth in this volume. Methods of building roads for various purposes are described in non-technical language by an authority.

Experimental General Science, by Willard Nelson Clute. Published by P. Blackiston's Son & Company, Philadelphia, Pa., 1917. Size, 4¾ x 7¼ inches; 304 pages, with 96 illustrations; price, \$1.25, net.

This is a modern textbook in general science intended for use as a preliminary to the more specialized courses in science usually given in high schools.

Small Boat Building, by H. W. Patterson. Published by the Outing Publishing Company, New York, 1916. Size, 4½ x 7 inches; 144 pages, plus 10 triple-page plates, printed on thin paper; price, 80 cents, net.

This book has been written to enable amateurs to be more successful in building small boats. It does not describe any one particular boat, but gives information which may be applied to the building of several different kinds. The author, himself, was once what he terms the "greenest kind of an amateur" in boat building, but he has endeavored to place in this volume just what would have been helpful to him when he first became interested in the alluring craft of boat building. The illustrations are a very important part of this little book.

Printers' Manual of Syllabication, by Charles L. Woodfield, director of Chicago Typothetae School, 536 South Clark Street, Chicago, Illinois. Price, 10 cents.

This tiny book consists of 12 pages, 4½ x 2¾ inches in size. It presents a "bit of concrete knowledge" adapted to the particular needs of printers.

MANUAL TRAINING MAGAZINE

MAY, 1918

AGRICULTURAL TRAINING FOR CITY HIGH SCHOOL BOYS

WILLIAM J. BOGAN,
Principal, Lane Technical School, Chicago.

ORGANIZATIONS or individuals that expect to appeal to high school boys for any object requiring the expenditure of money or labor ought to begin careful preparation long in advance. In the moral nature of the school-boy there is usually a background of idealism, but the foreground is often cluttered with sophistication, cynicism and doubt. Camouflage has become part of his art course, and he seems to see it everywhere; at least he looks for it everywhere. Frequently he sees it where it is not. To counteract the effect of this sophistication is no easy task. Facts and figures must be presented backed by affidavits. Incontestable proof must be given for every statement.

When the world war opened in 1914 calls for aid from many sources were foreseen by the schools. The tragedy of Belgium, the massacre of Armenia and the horrors of Poland drew upon the sympathy of every pupil. Pleas for aid in great crises nearly always bring generous response, but a request for money or labor in preparation for a remote contingency often falls on deaf ears; it lacks dramatic appeal. It is especially difficult to make boys understand that patriotism does not always require the offer of one's life as soldier, sailor or aviator. A campaign of education is necessary to convince boys that the nation has many other needs in war times.

As a preparation for the demands certain to follow in the wake of war, the

Lane Technical High School planned a series of mass meetings to be attended by every one of the 2,500 boys and young men in the school, together with as many parents as could leave their work for such occasions. As the school hall was not large enough for these meetings the trustees of the Rader Tabernacle were asked to give the use of their immense church building, one mile distant from the school. Not only was permission granted to use the building but heat was provided—no simple sacrifice in the past awful winter. Every two weeks during the year the boys marched in military formation from the school to the Tabernacle and back again headed by the school military band of sixty pieces and the volunteer cadets in uniform, numbering 500. No one who has seen this mile-long column of boys marching four abreast with regular step and military mien will ever forget the surge of patriotism which the spectacle always evoked. Aching hearts and tightening throats gave notice to the bystanders that farm training may be but a preliminary to the more serious training for the trenches. It gives every visitor a thrill to see the large audience of boys stand at salute while Old Glory is brought from the entrance of the hall to the platform by a guard of cadets, as the band plays "To the Colors" and "The Star Spangled Banner." On these occasions a speaker of reputation explains to the boys the particular activity in which he is engaged. In

this manner information has been conveyed to the school regarding the liberty loan, the Red Cross, the Y. M. C. A., food conservation, thrift stamps, and food production.

When the request first came to the school from the United States Boys Working Reserve to train boys for work on the farms of Illinois and other states of the

the Reserve was organized hundreds of boys volunteered for service on the farms, but many were rejected as unfitted for the work. Those who were accepted form an enthusiastic group of several hundred extremely intelligent boys who are proud of the opportunity to serve the nation as members of the Reserve.

The skeptical farmer may say "I am



LEARNING TO OPERATE A MOWER

Middle West a mass meeting was held for the purpose of presenting all the essential information available on the subject. The federal director of the Reserve and several officials of the State Food Administration showed the great need for helpers on the farm, a need that might persist for the next five years. The educational value of farm work interested the boys, while the patriotic appeal to aid the soldiers and sailors who are offering their lives for the nations and for humanity met with a remarkable response. When a branch of

not paying for enthusiasm or for patriotism, but I am willing to pay for common sense and energy. If I am required to spend much time in supervising green city boys they will not be worth their salt. The summer is too short for experiments."

Unfortunately the products of the school cannot be guaranteed. Nor can boys who prove unsatisfactory to the farmer be replaced easily. The school must do its best and trust the boys. They must be taken on faith. To stiffen the weak faith of the farmer the following outline of work is

given. If it does nothing else it will prove that the intentions of the pupils and teachers are sincere and patriotic.

Each one of these boys has had a course of practical work in shop or drafting room extending over a period of from one to three and one-half years. The many experiments thru which they have passed have made them very adaptable to new

work, to say nothing of the usual subjects given to all boys in the high schools, the boys who enlist for farm service are given a course of special instruction in several of the most important phases of farm life. Correspondence with farmers shows that their greatest need is for boys and men with a practical knowledge of horses. The farmer does not expect to turn his farm



A CORN CULTIVATOR. THE BRICKS REPRESENT HILLS OF CORN

conditions. They know the meaning of work and have some sense of responsibility. In their regular high school course they have learned the elements of simple carpentry in the first year; they have had forging and founding in the second year, machine shop practice in the third year, and electrical construction, including the making of engines and electric motors and the care of many kinds of power-driven machines, in the fourth year. Drawing is given in each one of the four years.

In addition to this shop and drawing

over to the boy from the city. He will not expect the boy to know everything. He will be well satisfied if he can find a boy who is able to follow simple directions. The boy who can be trusted to do his daily work while out of the farmer's sight is an invaluable asset. Good horses cost money and an irresponsible boy can do more harm in five minutes than his labor might compensate for in five years.

In preparation for practical instruction in the care of horses the Board of Education provided the school with eight horses

from the police department reserve. They are kept in a barn near the school and are cared for by the pupils under the direction of a practical farmer who is also an expert on horses. Boys working in groups of six or eight are required to give every day a satisfactory imitation of a farmer at work on his farm. In small classes they are taught the care of horses and stables, how

school boys. They are given instruction in the use and care of the common farm implements. Great emphasis is placed on practical work. Practice with the corn cultivator is very interesting. A row of bricks standing on edge on the ground, Fig. 2, represents a row of corn which the boy must cultivate without destroying any of the hills. In his practice work he must



INSTRUCTION ON THE TRACTOR

to harness and unharness, how to hitch a single horse, a two-horse team, a three-horse team, and a four-horse team. When these complicated tasks have been successfully performed the boys are permitted to drive. To a farmer boy these tasks may seem very simple, for he has been used to them all his life, but to many city boys the act of going into a horse's stall is a great adventure. They are taught to hitch to wagons, plows, cultivators, and to other farm implements. They are taught to do chores—a lost art among city high

drive so carefully that none of the bricks will be upset. Driving a team thru the streets will not develop this accuracy, for as one of our farmer visitors said, "It is one thing to drive and another thing to drive *somewhere*." When time hangs heavy on their hands they are taught other phases of farm work, but they are kept busy most of the time learning the rudiments. The frills will be left for post-graduates.

A special group of boys, most of whom have had practice on the farm, are taking

a course of instruction on the farm tractor. This work includes the maintenance and operation of farm tractors and farm implements of all kinds, including a course in the theory of tractor engines and other farm engines, how to detect and correct common troubles of the engine, the regulation of the engine for economical operation, and general information on the use

receives considerable attention. Cattle, sheep and hogs are studied first thru books and then thru visits to the stock-yards. Some knowledge of dairying has been acquired by visits to the large dairy farms near Chicago. Thru these visits the boys have gained ideas of farm life uninfluenced by the glamour of magazine or newspaper descriptions. Enough knowledge of soils,



DRIVING THREE HORSES TO A DISC

of engines on large farms. The instruction on tractors and other farm machines is in charge of two teachers with special qualifications for the work. These men have had shop experience and technical training, together with long experience with autos and farm engines. Electrical construction and supplementary work on gas engines are given in the regular shop classes of the school. Special attention is given to trouble finding, adjusting and repairing.

Classroom work is given to supplement the practical work with horses, machines and small implements. Animal husbandry

fertilizers and plants is given to enable the city boy to look intelligent when these topics are under discussion.

A keen sense of responsibility has been developed in every boy. If the farmer is patient and willing to teach he may feel sure that the boy will prove worthy of his hire. This experiment of the U. S. Boys Working Reserve is not planned for the coming summer only. It will be tried with even greater success year after year and for many years. It is a good lesson in co-ordination and co-operation.



BENSON POLYTECHNIC HIGH SCHOOL, PORTLAND, OREGON

MANUAL ARTS IN PORTLAND

EDWARD G. ANDERSON,

Instructor in Industrial Center, Seattle, Washington.

IN these days when teachers of the manual arts are searching for suitable shop problems that will co-ordinate with the Government's plans for winning the war, consideration should be given to what is being done in Portland, Oregon. Under the supervision of L. L. Summers the Manual Arts department has a record of accomplishment of which any city school system might well be proud. The boys in the shops have made the usual number of knitting needles, coat hangers, game boards, bandage rollers, camp tables, and packing cases which our school shops are turning out in quantities the country over. Child's furniture to the value of \$500, has been constructed and sold, the proceeds being devoted to the Red Cross. This furniture was constructed in the grade shops and was decorated in colors by the eighth-grade girls.

Perhaps the most interesting feature of the work in Portland is the construction of back-yard chicken coops. To quote Mr. Summers, "Nearly every manual training center in the city is connecting industrial work with the chicken industry. Small full-sized chicken coops have been made to meet the demand for the city chicken venture.

These houses are without yards, have a scratch-pen extension, and are designed for six to ten hens. They are both sightly and sanitary as they are built on skids and can be moved each week. There are many valuable lessons in this particular



RABBIT HUTCH

phase of vocational training. It offers a splendid lesson in house construction as well as a project in group work which teaches co-operation.

"For the boy who buys the chicken house for the actual cost of the materials, there is opened a great field of opportunity. Hens must be given constant, regular attention



CORNER OF ELECTRICAL DEPARTMENT, BENSON POLYTECHNIC HIGH SCHOOL

and the house and scratch pen kept clean and sanitary. Making use of garbage is a lesson in economy as well as a way of partially solving the problem of garbage disposal. It makes the boy a producer and a member of a great billion dollar industry. By adding chicken accessories, rabbit

hutches and dog houses, the work of the shop is closely connected with the care of animal life which all child-training experts claim is so necessary for the best child development."

In Portland the school garden movement is more fully developed than in any



CHICKEN HOUSE FRAME



CHICKEN HOUSE COMPLETED, EXCEPT THE ROOFING PAPER



MACHINE SHOP, BENSON POLYTECHNIC HIGH SCHOOL

other American city, and the garden supervisors are co-operating with the manual training department, giving all the boys who construct houses instruction in chicken raising during the summer months. Several hundred houses have already been built and no doubt this movement will result in a greatly increased egg production in Portland.

Mr. Summers has emphasized the need of home industrial work. This has resulted in the construction of 1,500 workbenches for home use. Each bench cost the pupil \$1 for lumber and 60 cts. for the vise-screws. By means of this home-shop plan the time devoted to industrial work has been doubled.

A department of printing is established in the Jefferson High School. This department does the printing for the Port-

land schools. What cannot be done during school hours is completed after the regular school day is over. The boys who work after school hours are paid from 12½ cts. to 32 cts. an hour. Printing is confined to work for the schools, there being no desire to compete with commercial institutions.

The pride of the school system is the splendid new Benson Polytechnic High School, completed in September, 1917, at a cost of \$600,000. The building is located on a site of 7½ acres, and there is not a better equipped high school in the United States. The work being done is of exceptional quality, altho full use is not being made of the equipment. Because of the great need for skilled mechanics this condition should and doubtless will be remedied. The work offered at this school

is similar to courses in other technical high schools. Provision is made for over-age children to enter the shops for industrial training even tho they have not completed the elementary school. The machine shop offers a course in tool, jig and die making. Sixteen graduates of this course are employed in an Eastern munition factory, and this factory has offered to pay the traveling expenses of the entire June graduating class from Portland to the

east, so anxious is it to obtain tool-makers.

The work of this school is not under the supervision of Mr. Summers, but is in charge of C. E. Cleveland, formerly principal of the Boys' Trade School. This school has been discontinued and the Trade courses placed in the high school. It is to be hoped that the work will soon be organized on a war basis and permit of complete use being made of the facilities of the school.

SPLINTS

GEORGE M. MORRIS.

Assistant Director of Manual Arts, Boston, Massachusetts.

IN THE May, 1917, issue of this MAGAZINE there appeared an article on "Canadian Red Cross Splints," by George W. Sievers, Instructor in Manual Training, McKay P. O., Vancouver, B. C. This article attracted the attention of many in this country who have the management of manual activities in schools, and naturally suggested the question of what splints could be made for use by the War Department of the United States.

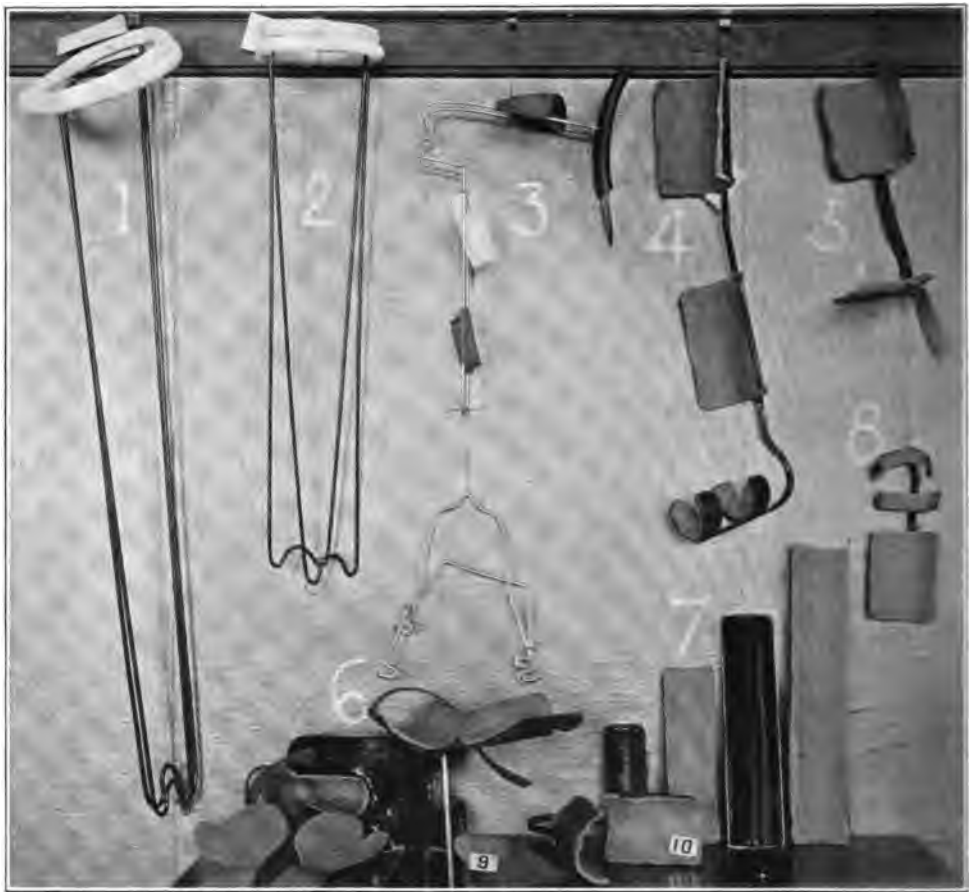
In Boston, John C. Brodhead, associate director of manual arts, took the initiative for his city, and for months followed every available clue which might lead to constructive suggestions. Local army surgeons were consulted, and in each case the inquirer was referred to other officials. Among those who were consulted are Dr. John A. Hartwell, of New York, Dr. Mark H. Rogers and Major E. G. Brackett, of Boston, and Capt. John D. Walker, Medical Officers' Reserve Corps, office of the Surgeon-General, Washington, D. C.

Mr. Brodhead's letter to Captain Walker reached Major David Silver, of the Medical Reserve Corps, Washington,

who ordered a set of standard splints made. They were sent to a physician in Boston, and later turned over to the Department of Manual Arts. The set consists of the following:

- 4 simple straight splints,
- 1 Bradford frame,
- 1 Bradford abduction frame,
- 1 Thomas knee splint, with removable attachments,
- 1 combined ankle and lower leg splint,
- 1 rectangular foot splint,
- 1 abduction arm splint,
- 1 extension arm splint,
- 1 humerus extension splint,
- 1 elbow splint,
- 4 hand, wrist and forearm splints,
- 2 Hodgen right and left splints.

At first it was hoped that wooden splints would be in demand; but it seems that such are for first-aid work and are supplied chiefly across the water. The sheet-iron splints submitted are for later use upon the return of wounded soldiers to this country. In expectation of having the splints made in high school shops, detailed drawings have been made in the



U. S. STANDARD SPLINTS

Boston Mechanic Arts High School. In case this is found practicable an estimate of the cost per set will be furnished the supply division of the government and orders obtained in the usual way.

The matter of standardizing splints and other mechanical devices is in the hands of a committee of which Capt. John D. Walker is the head. The results of this committee as they may affect the splints here referred to are not known

to the writer, but it is fairly certain that the splints here shown will be needed in large numbers.

As work preparatory to caring for our wounded progresses, the opportunity for schools to participate in service of a constructive nature will increase in number and variety. That schoolmen generally will be ready to meet their new obligations due to war conditions goes without saying.

This is a war in which the children of America have more to lose than anyone else, as the greater part of their lives lies before them. Therefore, if we lose, they will have more years short of all that makes life dear than we of maturer years. God grant that we may leave to these children the freedom and equality of opportunity which we ourselves inherited from our fathers.

—GOVERNOR LOWDEN, of Illinois.

LETTERS ON VOCATIONAL GUIDANCE.

PHILIP S. HASTY AND CHARLES A. BENNETT.

This very frank and friendly correspondence on vocational guidance is published because it expresses doubts and ideals, hopes and faith concerning a problem that seriously concerns the present-day educator. When written there was no thought of publishing the letters, but some friends who have read them think their publication desirable, and the writers were willing. Perhaps they will stimulate further discussion of the practical phases of vocational guidance.

—THE EDITORS.

My dear Mr. Bennett:

Since hearing the discussion at Indianapolis concerning prevocational education I am thoroughly convinced that we are still in the kindergarten stages of development and that, truly, "there is more to be said on this subject."

Almost universally, those who spoke on this topic did not refer to prevocational training, in a broad sense, but apparently restricted not only their remarks but their thoughts to that small portion or field of prevocational training which might be termed pre-industrial or elementary industrial training. In other words they were thinking in terms of that comparatively small and selected group of boys who, in their opinion are surely headed for industry and who would, therefore, profit by a large percentage of shop work. For such boys, within a year, according to most plans advocated, prevocational training becomes vocational by the selection of some special line for intensive work.

Practically no mention was made of work for girls.

Now my idea of prevocational training is something much broader than this—a form of training which will include all of the boys and girls in the junior high school, at least, and perhaps in some of its phases extend farther down into the grades. No doubt there is a place in each community for the elementary industrial type of work, but only as a part of a broad or complete scheme of prevocational endeavor.

I find it impossible, in my own mind, to divorce vocational guidance and prevocational training. They are part and parcel of the same thing and should both begin in the kindergarten or first grade (so far as the public schools are concerned, because this is the earliest age at which we take charge of the child's education.) At this time the simpler processes of industry should become familiar to him thru

study and the actual handling of materials. I need not outline this more fully as we are all familiar with the theory of Dr. Bonser regarding this point.

At the time, or soon after the time when the work for boys and girls becomes differentiated, there should be established a special course for purposes of vocational guidance and prevocational education. Such a course I have chosen to brand "Occupational Information" for want of a better way to express my meaning.

The beginnings of such a course might well be made in the fifth grade and develop into a well-rounded and comprehensive subject by the time the pupil enters the junior high school.

As I see it, such a course should consist of two parts—1. Theory. 2. Practice. In this respect it would be similar to a course in a science such as chemistry.

The laboratory work or practice would be largely differentiated for boys and girls. The girls would work in the household arts as a part of their training and in such other lines as simple commercial branches, agriculture, elementary science, printing, etc. The boys would be given a round of shop experiences from which to choose—printing, carpentry, electrical work, cement work perhaps, sheet metal, joinery and cabinet making, etc. In addition to these, simple commercial work, agriculture, and possibly elementary science.

The related "occupational information" would, in a broad way, fall under two heads, as follows:

1. What demands does the occupation make upon the worker?
 - a. Physical.
Peculiar abilities required.
Length of schooling. Accompanying financial burden.
 - b. Mental.
 - c. Moral.

2. What does the occupation offer the worker?

- a. Chance for promotion.
 - Local or country wide.
 - Organization of labor.
 - Steadiness of employment, etc.
- b. Health conditions.
- c. Moral conditions.
- d. Opportunities for recreation and self-improvement.
- e. Opportunities for service in the community.

Much of this information such as that concerning law, medicine, teaching and the other professions; agriculture, commercial pursuits, etc., could be presented alike to both boys and girls. Other information such as that concerning the household arts for girls and certain lines of industrial work, for boys, would, necessarily, have to be given separately.

There is little organized material available for such a course. Such information would have to be gathered from many places and presented in the form of lectures, slides and moving pictures, visits to various industrial establishments, lectures by prominent men and women in the community who can speak with authority upon the occupations which they represent, and thru assigned readings, investigations and reports.

The entire course, beginning with the seventh grade, at least, should occupy from 80 to 120 minutes per day, five days per week. The exact division of this time would have to be a matter of experiment, but it seems to me now that about two days for occupational information and three days for practical work would be about right.

As much as possible of this information should be put into printed form and distributed thru the homes in the community so that the parents may be able to assist their children in making an intelligent choice.

Such printed information might also be used as reading material in the grades below, if simply written, as it should be.

The exact limits, as to grades, within which such a course might profitably be given must necessarily be a matter for experimentation.

In fact I think it would be better stated in terms of age rather than grade, and should begin, as a separate subject, at least two years before the child reaches the compulsory age limit, regardless of grade. This would mean

that most pupils would receive such instruction at some time during the three years of their junior high school course.

For those who go on to high school and who have not yet made a definite and final choice, such a course might be continued with profit, as an elective.

I shall be glad to hear from you in regard to the plan here proposed as fully as you may find time to write. Yours very truly,

—PHILIP S. HASTY.

Dear Mr. Hasty:

I am glad to get your very interesting letter of the 6th inst.

In reply to your request for comment, I see no reason why I should not speak very frankly. I am at present quite unsatisfied with the discussion of prevocational education. In fact, I do not like and never have liked the term prevocational, and I think you know that. On the other hand I have an idea that the present discussion is good for us and will be better still for the next generation. I think the new terms "prevocational" and "vocational guidance" have been good reagents in the educational flask and that after a while there will be a precipitate, and then clearer thinking on the subject.

To me there is one outstanding omission when we discuss the subject in general terms. We forget that practical school conditions are extremely varied in this country of ours, and that much of our misunderstanding is due to the fact that in discussion we are not basing our statements on the same set of conditions. There is too much of an effort to develop a single formula that will apply to all conditions, and then work by that formula.

Haven't we pretty nearly reached the point where we would be willing to change the form of our discussion to apply to actual school conditions? For instance, we might say this: In a rural school when there is only one teacher for all grades, occupational information and vocational guidance and training may well be infused into the whole scheme of training, after the manner of *The Brown Mouse*.¹ If this is so, then the problem is one of re-orienting the curriculum and the teaching in such schools—no easy job, but in my estimation capable of

¹*The Brown Mouse*, by Herbert Quick, published by The Bobbs-Merrill Co., Indianapolis.

yielding great returns on the investment of "gray matter." Here again we must not expect all schools in all states to teach entirely the same body of subject-matter, but all would teach certain selected facts and principles. But there must be some means of getting away from such human slavery as I learned the other day from a rural school teacher in Ohio who told how her work was prescribed almost to fifteen-minute periods, day in and day out, by the present minutely supervised graded system. That young woman is a parrot—a talking machine, not a teacher. It would seem almost criminal to ask her to add "occupational information" to such a program, but if she were free to be a real teacher, she might make occupational information the basis for much reading, composition, geography, science, history, civics, etc. But she must get the point of view, and the information first.

Now by setting aside this class of school, with its problems solved or unsolved, we have eliminated a big slice—many million children—of the prevocational problem. Then we come to consolidated and town schools where one teacher has no more than two grades and the possibility at least of departmental instruction above the sixth grade. What shall we say for prevocational training and vocational guidance here? For my part I see no advantages, but several disadvantages, in trying to separate "sheep from goats" in such a school. The most that I would be willing to do would be to carry individuals as far in the direction of their bent and probable occupation as a broad-minded, sympathetic, wise and skillful cooperating group of teachers could carry them. To assist them I would endeavor to provide a reconstructed curriculum, suited to the general school and community conditions, and just as many tools, pieces of science apparatus, books, photographs, etc., as the teachers could really use effectively and the community would pay for. The motto might be "No favorites. Everything open to everybody. Each pupil is urged to partake according to his interest, capacity and the use he can make of it."

When this is done you have left only the cities of considerable size—the rather highly specialized, congested spots in our population. Now we come to the place where the elementary industrial school is a practical possibility. The first question is as to its desirability. If I had my way I would work hard to revise

curriculum and methods, putting so much occupational and vocational guidance into the regular scheme that the elementary industrial school would be regarded as a necessity only in rare cases. I would have departmental instruction above the sixth grade. Probably I would call this section of the work a junior high school. I am not yet sure that I would separate "occupational information" into a course by itself even under a departmental system, but I am sure that I would have such information a factor in the scheme. I believe now that I would prefer to have some of it in nearly every course, so that the pupil going to the science teacher, then to the history teacher, then to each manual arts teacher, and so on, would get more direct, varied and vital information and not be loaded down with facts and statistics.

But you will see that while I claim that such a scheme as I have outlined is very practical from the standpoint of general school conditions, it depends upon one essential and awful (!) change—a re-oriented curriculum—a "Brown Mouse" proposition all along the line.

"There's the rub," as our friend, William Hawley Smith would say. Are we strong enough to put it over? Are there enough men who have caught the vision? Have we the courage? Are we wise enough? Will we do it?

You see I agree with you in many points—in most, I think. But I am not sure that the theoretical side of "occupational information" really ought to be a subject in the curriculum, if that is what you mean to suggest.

When I started this letter I did not mean to unburden myself so fully. I hope it will have no bad effect upon you. I shall be interested in your reaction to it.

Sincerely yours,

—CHARLES A. BENNETT.

My dear Mr. Bennett:

I was very much interested in your analysis of the situation as regards the introduction of prevocational and vocational education. Most of us are doing just what I did when I wrote you—that is, eliminating without discussion, all phases of the situation except our own little part. We feel that our problems are the big problems and that everyone should be interested in them and think as we do about them. We need just such an analysis as you presented to me to bring us back to facts, now and then.

In the final analysis I do not believe we differ very much in our ideas.

I believe that in any school, whether it be rural, town or city school, occupational information, vocational guidance and vocational training should not exist, as such, below the point where the work for boys and girls becomes differentiated. This might not be, in the rural school, until the end of the eighth grade. In some of the larger consolidated schools where some departmental work is done, it would come earlier than this.

Here in Topeka, at present, we are separating the boys and girls at the beginning of the fifth grade in order to give the girls two years of domestic science and two years of domestic art before the end of the eighth grade. Dr. Bonser, in his work at the Speyer School advocated that boys and girls do the same work thru the sixth grade.

It is certain that no set age or place can be determined for all schools. This seems to me quite clear, however, that up to the point of differentiation, all of the "vocational" elements mentioned should be, as you say, infused into the whole scheme of education. The big struggle is going to be to get the right curriculum and the right teachers. It is surely worth the effort. The slowness with which those who write and those who pass upon the curriculum, move, leads me to believe that our greatest hope lies in re-orienting the teachers thru the normals and colleges. I have been trying, during the three years that I have been here in Topeka, to lead the teachers of the first four grades into an understanding of the possibilities of industrial arts work as closely related to, or rather a part of history, geography, etc. Some of them have seen the light but the great majority still prefer handwork projects which are practically unrelated to the other work of the grade and in large measure unrelated to any of the activities in which people engage in the earning of a living.

In the larger schools where departmental work is possible above the sixth grade I still believe we should depend upon all teachers and departments assisting in such vocational guidance and occupational information as may be given, up to the point where boys and girls are separated, for a part of their work, at least. Even at this time I am not ready to separate the "sheep from the goats." I agree with you that "to assist them I would provide

a reconstructed curriculum, suited to the general school and community conditions, and just as many tools, pieces of science apparatus, books, photographs, etc., as the teachers could really use effectively and the community would pay for." Wherever a large number of seventh, eighth and ninth grade pupils can be brought together, as in the true, so-called junior high school, or intermediate school, I would have, in addition to the science work, three distinct departments—academic, commercial and industrial (here I include home economics)—and possibly a fourth, in some schools, at least, that being agriculture. These courses I would have open to both boys and girls, and all courses at this time would lead to graduation and to high school entrance. Pupils could then select the large group—academic, commercial, etc.—in which they wish to do the major part of their work. If a wrong choice of group is made it should be discovered as early in the game as possible and a change made.

The place that "occupational information," as such, would have in this scheme would be this: The pupils taking commercial work, for example, would spend possibly one-third of their time (more or less) on strictly commercial branches: those taking agriculture and industrial work about the same amount. Now out of this time set apart for their specialty I would take an hour or more per week (according to the total time allotted) for occupational information, as such. Where possible I would bring both boys and girls together at the same time and from all groups. Those who *think* they want to follow commercial branches have a right to know of the demands and rewards of the professions just the same as the fellow who is following an academic course with his eyes definitely on such a goal. So, also, it would not be amiss to let the fellow headed for the professions know something of the possibilities of industry.

My point is that all of these people should have just as broad an outlook upon the possibilities of the future as we can give them. Furthermore, I believe the only way to be sure, at present, that we are imparting the needed information is to make a separate subject of it, and make some person or persons directly responsible for its being done regularly and well. You know, even better than I, that the way to get a thing done is to make it the special business of some one person or group

of persons. Instruction that is incidental is not apt to get so very far. Until I see "occupational information" definitely and adequately written into the regular subjects I shall feel safer to have it set apart as a separate thing for special consideration.

Having cared for as many as possible of our boys and girls thru the regular channels, as outlined, there may be a place, in our cities for a type of school or work—call it elementary industrial, or what you will—offering a larger percentage still of some sort of handwork and a correspondingly smaller percentage of academic work. Even in such schools or classes I should dislike to see boys and girls below the age of sixteen allowed to take a course which would bar them from high school,

should they later wish to go on. I firmly believe, however, that boys and girls could be allowed to enter such a school at fourteen, remaining for two years and spending fifty per cent of their time on handwork and still get academic work in sufficient quantity to justify us in allowing them to go on if they wish. At the age of sixteen there might be some who would wish to specialize in a particular line of industry. For such boys or girls the prevocational work of the two previous years would become vocational, the working day would be still further lengthened and the amount and quality of work improved. Such would then, of necessity, go definitely into industry.

Sincerely yours,

—PHILIP S. HASTY.

HOW I STARTED MY GRAMMAR GRADE BOYS THIS YEAR.

FOURTH ARTICLE.

TO WRITE briefly on "How I Started My Eighth Grade Class," some things must be taken for granted: (1) That the students have had all the subject-matter and necessary training to undertake the new problem. (2) That all in the class work on the same kind of a problem but not necessarily the same project.

First in consideration was a review or reminder of shop rules relating to signal bells, leaving the room, shop conduct, etc., so each boy would form the correct habits from the first day. The problem for this class being a stub mortise-and-tenon joint, I explained fully what such a joint was, the proper place to use it, its requirements of proportion, strength, use of glue, etc. A few examples of its use were suggested and also a sample of the joint shown to the class.

The object in representing the problem in this order was to give the boy a clear idea of what was required of him and then give him all the information he needed about the problem so that he could choose a project with some degree of in-

telligence to fit the requirements of the problem.

If the boy can select and design his own project he is allowed to do so, but if he cannot without abusing this privilege he is assigned one of the standard projects outlined in the course. It is somewhat easier to create interest in the work and better work will result from a course that is flexible enough to let students choose projects to fit the required problems.

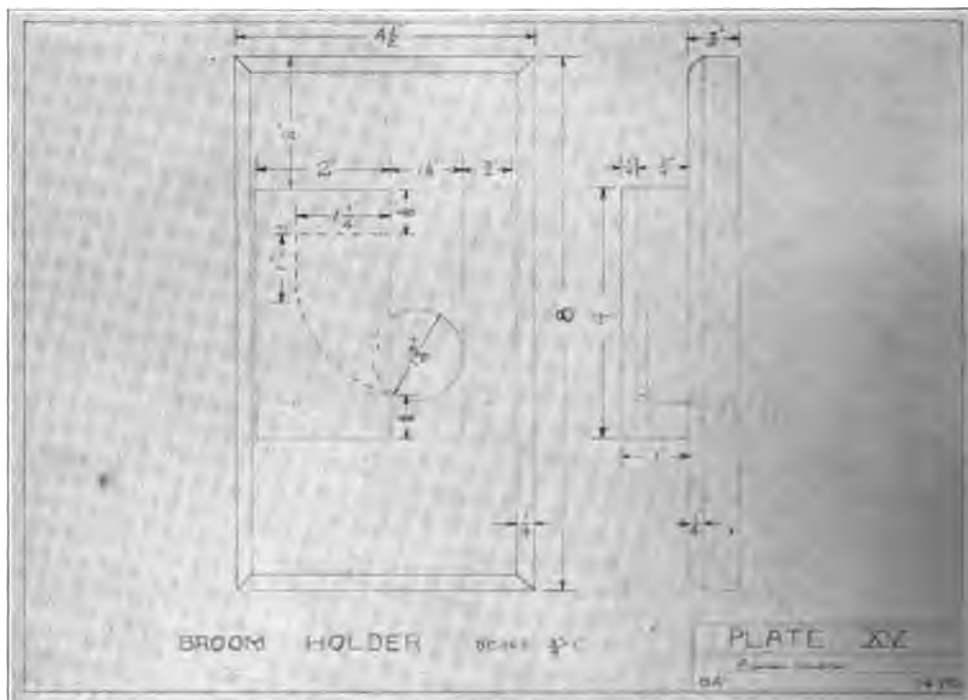
When the boy has decided on his project he makes a shop drawing, both assembly and detail, if the problem requires it. Considerable individual help is given by the instructor to the drawing of the project so that the proportion, shape, etc., become the project and also that the boy may learn to work a thing out completely on paper and then follow it in the shop without making changes from the drawing. That is, he should learn to see the problem in his mind before he makes it in the concrete materials. If he does not have these ideas his shopwork will show the result of not having them. —R. M. ATTWOOD,
Webster School, Minneapolis, Minn.

WHAT is the keynote to successful manual training work in the grade school? This is the question which I ask myself at the beginning of the term. The answer is, undoubtedly, *interest*.

My problem, then, was to arouse, if it were not already there, a real interest in

should be the dressing of the tops of the benches.

The benches, which are made of segments, were first planed across the top. The boys learned the necessity of keeping the planes set very fine. After the tops were scraped and sanded, two coats of



DRAWING OF BROOM HOLDER MADE BY 8-A BOYS BEFORE STARTING THIS PROJECT IN THE SHOP

the shop, as well as in the project which each boy would make for himself, during the semester. I particularly wanted every member of the class to have a personal interest in the upkeep and appearance of the shop.

I knew the best way to get this was to get the boys to work, really doing something, as soon as possible, omitting any "lecture course" which might serve as a "time killer."

The class best prepared to start right off, after the summer vacation, most certainly was the eighth grade class. I decided their part in the general work

shellac were applied. Since then I have decided it was the best thing that I have ever done, as careless marks and cuts are things of the past.

Then followed a review of tools and tool processes, in which the boys showed lively interest, because they had received a little taste of actual work.

In the review of tools, each tool was taken up, as near as possible in the order in which it came at the time the boy started his shopwork. This review was short. It was what we call in our shop a "reminder lesson." For instance, in taking a plane, we discussed name of plane,

kind of tool, important parts, adjustments in order to achieve the best results, and the method of sharpening.

Before the big project is made I try to find some small problem, which has never been made in the shop before, but which must be made accurately in order to fulfill its use. One of these problems, tried this year, was a broom holder. The working drawing was made in the mechanical drawing period and later the holder was completed in the regular shop period.

The eighth grade boys have two ninety-minute periods a week. They were given a choice of any project they wished to make as they had had training in the sixth and seventh grades.

Such articles as library tables, pedestals, rocking chairs, sewing chairs, dressing tables and tea tables, were chosen. These pieces are now finished as the term's work.

—HOWARD C. FAUNCE,
Indianapolis, Ind.



SOME OF THE WORK COMPLETED BY 8-A BOYS, AS THEIR INDIVIDUAL PROJECT FOR THE TERM,
INDIANAPOLIS, INDIANA

EDITORIAL REVIEW OF THE MONTH

IF there have been times during the past winter when the manual training and industrial schools were being needlessly held back in their efforts to help in the war work there seems to be evidence that such times are now past. The schools are finding new work to do, and the various organizations connected

I think there can be no further complaint from manual-training workers that there is nothing they can do in the way of war service. Opportunities certainly are coming to us in Cleveland.

We have just completed six dozen game tables for Y. M. C. A. cantonments. Two dozen each of these were made in our East and West Technical High Schools, and one



MAKING TYPEWRITER DESKS FOR THE BOARD OF EDUCATION, EAST TECHNICAL HIGH SCHOOL, CLEVELAND

with the war are at least beginning to realize that the schools can, under proper regulations, render efficient service.

In this issue we present the timely article on agricultural work by Mr. Bogan and the interesting suggestions about chicken raising in the article by Mr. Anderson. The article by Mr. Morris is indicative of the untiring efforts of the Boston staff to be of real service.

Letters reaching us recently indicate that more war work is now available for the schools. The following from Supervisor Roberts in Cleveland is especially to the point:

dozen each in our Brownell and Mound Industrial Schools. The two dozen at East Technical High School were completed between 3:00 o'clock, February 25, and 4:00 o'clock on February 27, practically all of the pupils of the woodworking department having a part in the work. The boys and girls of the art department were called into action in painting the checker-boards. I am sending two photographs of East Technical High School students working upon this particular project.

We have just had a call from the Red Cross for large quantities of tongue depressors and applicators. We are expecting to place this work in the hands of fifth and sixth-grade children in knifework classes, and be able to turn out these supplies in lots of ten to twenty thousand.

An appeal has just come from the Junior Red Cross for furniture for Red Cross houses in the various cantonments, and we have been asked to direct the work for the district including Ohio, Indiana and Kentucky. The work includes the making of tables, screens, andirons, lamps, shades, ink-wells, blotter ends, rugs, quilts, etc., in quantities of from ten to one hundred each. The selection of articles seems to be well made and within the capabilities of boys and girls of the manual training

A NATIONAL SERVICE COURSE IN MACHINE WORK

PRATT INSTITUTE, Brooklyn, New York, has recently inaugurated a new type of short-unit course that deserves to be studied in other parts of the country. It is called the "National Service Full-Time Day Course in Machine Work." It consists of six units of six



PAINTING CHECKER BOARDS ON GAME TABLES FOR THE SOLDIERS, EAST TECHNICAL HIGH SCHOOL, CLEVELAND

department in various grades, including the high schools.

The third photograph shows twelve of my class of sixteen technical high school boys who are preparing to teach in September. They are taking up as shopwork, problems in production involving the use of machinery. The three years' technical work in the school has made most of these boys very skilful, and it is my thought to give them as broad a view of industrial work as possible as a background for their teaching work. The class is turning out a large number of typewriter tables, to be used in the junior high schools. Two hundred game stands for the department of physical education are also in process of construction by this class, and it is probable that we shall depend upon them for a large portion of our work for the Junior Red Cross.

weeks each. Its purpose is to serve the present need for increased productive efficiency in the country's machine shops. It is helping to supply the extraordinary demands arising from the war.

The course is intended especially for ambitious machine shop workers of limited experience, including machine operators, bench hands, and machinists' helpers, who wish to extend and broaden their practical training, thus increasing their earning power and enabling them to render a better service to the nation.

The six courses which follow one after the other, beginning February 11th, are entitled (1) elementary lathe and bench

work; (2) lathe work; (3) advanced lathe work; (4) operation of machine tools; (5) advanced machine tools and elements of tool making; (6) tool making and related shop work. Each of these courses is organized to correspond with jobs that are available in the factories. A certificate is awarded on completion of the six courses, but any one may be taken independent of the others provided the student is qualified to enter it.

room and dance hall. But this was not enough for this progressive community, and for the principal of the school, Roy M. Austin. Manual training was wanted. A carpenter and cabinet maker, W. H. Miller, had taken up a homestead in the district and did woodworking for the ranchers. It occurred to someone that he might be induced to put in two hours a week instructing the boys at the school. He was willing, and secured a special state certi-



VARNISHING GAME TABLES, TECHNICAL HIGH SCHOOL, CLEVELAND

THE RURAL SCHOOL MANUAL TRAINING PROBLEM.

ANOTHER solution of the rural school manual training problem has just been brought to our attention. Out in Nelson, Montana, thirty miles from Helena, is a two-room schoolhouse known as the Beaver Creek School. It is a modern building with hot air heating system, a piano and a library. The schoolhouse was planned to be the center of the community life, and has movable desks and folding doors between rooms so that it may serve as church, auditorium, club

ficante, allowing him to teach.

Every student, boy or girl, who wanted to take manual training was told to bring a saw, a hammer, a jack-plane, a steel square, a screw-driver and a chisel to start with.

As stated by the principal of the school in a recent article in the *Normal Instructor*:

Some of the boys did not have the necessary funds, but that is a small matter to a Montana boy when it is the only thing in his way toward something he wants. Two boys did janitor work for the desired capital; another tried

trapping coyotes and made good; while another killed enough rabbits to finance his way. The girls were equally resourceful; one received a set of tools for a birthday present; two others borrowed the amount needed; while a third produced a steel square that her grandfather brought across the plains from Indiana in '69. A section of one of the cloak rooms was set apart for a manual training office. Work benches were made and ranged along the windows in one of the large class rooms, which was transformed into a manual training room simply by moving the pupils' desks to one side.

In planning for our manual training course, the thought is kept in mind that most of the pupils are to be ranchers and will make up the future Beaver Creek community; consequently, such exercises are selected as will enable them to secure training through designing and constructing things of practical use and service in their homes and on the ranch. This plan has already begun to work wonders. They lose no time from their regular work, but simply do this much more. The thoroughness, accuracy and attention to detail insisted upon in this work, react admirably upon the character of the students.

FARM IMPLEMENT HOSPITAL

IN our April issue we called attention to a leaflet prepared by E. A. White and sent out by the University of Illinois, describing "the farm machinery situation," and urging farmers to overhaul their machinery and put it in good repair early in the season. We ventured the remark that this ought to be a suggestion to teachers who are trying to be of the greatest service in winning the war. We have since received from Mr. White the following letter which gives so many specific suggestions to teachers interested in manual arts work in the agricultural sections of the country that we print the major part of it:

I have been especially struck with your suggestion that manual training schools be made implement hospitals, where machinery can be repaired, etc. This is an excellent idea and I hope that your publication may see fit to emphasize the necessity for this type of work as opportunity offers. It will open up a new

and very attractive field for manual training instructors.

In my opinion, most of the manual-training work given to date has not been well adapted to country conditions. Please understand that I am not blaming the manual-training fraternity for this state of affairs; it is a perfectly natural condition for up to date there has been practically no demand for this type of work. The organization created by the Smith-Hughes law, which this state is attempting to take advantage of, will offer an excellent opportunity for certain forms of what might be called manual training work in our country high schools and also in the home project work. I certainly hope that the manual training teachers and organizations of the state will take it upon themselves to see that everything possible is done to train teachers who will be competent to adapt this manual training work to country conditions.

To give you a little better idea of what I mean, I will take the liberty of suggesting lines along which I believe this work should be developed. Take iron work, for example: The boy should not only be taught the fundamental processes of bending, upsetting, and welding, but he should be taught how to repair farm machines; that is, plows, mowers, binders, sickles, etc. I should say that the majority of iron work on the farm is other than forging. In woodwork, the boy should be taught how to make gates, farm buildings, self-feeders, etc. Then there should be worked up a set of combination exercises which will call for the making of equalizers, neck yokes, wagon jacks, hay racks, etc. In addition to these standard exercises, we should pay attention to pipe work, concrete work, rope work, belt lacing, harness repair, etc.

We hope to learn that some of our readers are enough interested in this suggestion to really organize farm implement hospitals this summer. Next fall we would like to print an account of a manual training school that kept its shop running all summer, and sent out a Ford ambulance corps of repair boys on telephone call from farmers within a radius of twenty miles. Jobs that could not be done with the kit taken along in the Ford could be brought back to the shop. The

farmers would be glad to pay for prompt and efficient service, and the boys and their teacher would earn something and learn a great deal more. Boys with manual-training-shop skill, fire-department spirit, and ambulance-corps devotion could render noticeable service in this way.

PROFESSOR SIEPERT'S PROMOTION

WE are permitted to announce that Albert F. Siepert has been made head of the Department of Manual Arts at Bradley Polytechnic Institute and given the rank of professor. For the past two years he has been acting head of the department with the rank of assistant professor. Everybody connected with Bradley Institute recognizes this promotion as well-earned, and predicts a strong development of the department under his administration.

Mr. Siepert's professional career has been a remarkably consistent one; he has developed by a very simple formula. Nearly every year since he graduated from the Stout Manual Training School he has sandwiched teaching and study. While teaching at Iowa City he did part-time work at the University of Iowa. Summer school work has been in his regular program, and it helped him in getting his diplomas at Bradley Institute and Stout Institute. In three years while teaching at Montclair, N. J., he earned the B. S. degree in Education at Teachers College, Columbia University. Since then his summer study has been transferred to the University of Chicago.

In 1913 Mr. Siepert was called back to Bradley Institute to teach psychology and special methods. Since then he has made a special study of the training of teachers, and during the past year he has developed several new courses to meet new conditions in the field of manual arts and vocational training, which will be announced in the forth-coming catalog.

TO TEACH PATRIOTISM

MISS ETTA V. LEIGHTON. teacher of the Passaic Boys' Vocational School, is on leave of absence and is now the civic secretary of the National Security League. Her work is to stimulate the teaching of patriotism in the schools of the country. She is trying to get people to "live citizenship, not just mention it," as she says in her pamphlet entitled "Wake Up, Teachers of America."

In a recent letter Miss Leighton said of vocational classes, "More than other classes they must depend on their teachers, because the limit in time spent on textbooks and the necessity for correlating work must necessarily limit the time spent in social studies—history, civics and geography."

Correspondence courses in the teaching of patriotism are being offered free to teachers by Miss Leighton. Any one interested in any phase of this question should address Miss Leighton at the National Security League, 19 West Forty-fourth Street, New York City.

Let me express the hope that the young men of the country not now permanently employed may eagerly enter the Boys' Working Reserve to fit themselves by training and study for good citizenship and productive service. In this way they can show themselves worthy of patriotic fathers who have fought for Democracy in the past, sustain their patriotic brothers who are fighting for it today, and command the affectionate pride of the brave mothers who are silently bearing the burdens at home.

Cordially and sincerely yours,

—WOODROW WILSON.

WASHINGTON CORRESPONDENCE.

NATIONAL EMERGENCY IN EDUCATION

MUCH significance attaches to the organization and deliberations of the "Joint Commission on the National Emergency in Education and the Program for Readjustment During and After the War" which has been created by the National Education Association. In February, Mrs. Mary C. C. Bradford, president, appointed a committee to represent the National Education Association in outlining a program for "the rebuilding of civilization thru a war-modified education." President Finegan, at the recent meeting in Atlantic City, appointed a committee representing the Department of Superintendence to cooperate with this committee, and to these were added the members of the executive committee and of the board of trustees of the Association. These persons, 28 in all, constituting the Joint Commission, met in Washington, March 7-9th, and formulated preliminary plans.

Professor G. D. Strayer, of Teachers College, New York, is chairman, and Dean L. D. Coffman, College of Education, University of Minnesota, is secretary. The Commission makes its headquarters in the offices of the National Education Association, 14th Street and Massachusetts Avenue, N. W., Washington, D. C.

The Commission plans to "enlist the services of all the educators of the country and to cooperate with all the agencies related to educational readjustment in outlining a progressive program of education." A number of sub-committees have been organized to deal with special phases of the work, including: preparation of teachers, rural education, immigrant education, health and recreation, national service, drafting legislation, war emergency, education in foreign countries, lay support,

enlistment of the profession, necessary readjustment in education, educational agencies in Washington. As the work progresses the list of sub-committees will change as need arises.

A special drive is to be made for a substantial increase in the membership of the National Education Association. Figures prepared by the Commission show that the Association would have a membership of 140,000 if American teachers were to enrol in the same proportion as teachers in France and her colonies. The Commission has set the goal of this first drive at 50,000 members, and has indicated the quota that should be enrolled in each state to recruit this total. If the educators of the country could realize the importance of this move, every state would double its quota and more. Now is the time to demonstrate that there is a real professional spirit among teachers, and it is to be hoped that manual training teachers and directors will do their full share in responding to this call.

RECONSTRUCTION OF DISABLED SOLDIERS AND SAILORS

IT IS interesting to note that the War Department has adopted the use of the term "reconstruction" in official references to the work that is to be undertaken to assist disabled soldiers and sailors to as complete recovery as possible. A Division of Reconstruction has been organized in the Surgeon-General's Office, at the head of which is Dr. Frank K. Billings, of Chicago. Associated with him is a strong staff, including a number of army medical officers as well as educational experts. The latter include Major W. H. Henderson, Major M. W. Murray, and Major A. C. Monahan, whose appointments were noted in these columns in November last.

Major Henderson has recently been detailed to General Hospital No. 2, Fort

McHenry, Baltimore, to have charge of the educational work in that institution. Major Murray has been similarly detailed to Walter Reed General Hospital, Takoma Park, Washington, D. C.

In a statement recently made public, the Surgeon-General announces a list of 14 hospitals which have been designated as centers for beginning the work of physical reconstruction. These are located at the following places, in addition to the two just mentioned: Colonia, N. J.; Fort Porter, N. Y.; Fort McPherson, Ga.; Roland Park, Baltimore, Md.; Lakewood, N. J.; Dansville, N. Y.; Fort Oglethorpe, Ga.; Hot Springs, Ark.; San Francisco, Calif.; Des Moines, Iowa; Fort Riley, Kans.; Fort Sam Houston, Texas. Other hospitals will be added to this list from time to time.

STATEMENT OF POLICY

THE Division of Reconstruction will provide for the treatment of physical disabilities, for functional restoration, and mental rehabilitation, making use of the experience of other countries and following the best known practice. The following paragraphs are taken from the statement issued by the Surgeon-General:

That hereafter no member of the military service disabled in line of duty, even tho not expected to return to duty, will be discharged from service until he has attained complete recovery or as complete recovery as it is to be expected that he will attain when the nature of his disability is considered. The inauguration of this continued treatment will result, during the period of the war, in the saving to the service of a large number of efficient officers and soldiers who without it would never become able to perform duty.

Physical reconstruction may be defined as the completest form of medical and surgical treatment carried to the point where maximum functional restoration, mental and physical, has been secured. To secure this result, the use of work, mental and manual, will be required during the convalescent period. This therapeutic

measure, in addition to aiding greatly in shortening the convalescent period, retains or arouses mental activities, preventing "hospitalization," and enables the patient to be returned to service or civil life with the full realization that he can work in his handicapped state, and with habits of industry much encouraged, if not firmly formed.

SPECIAL EDUCATIONAL OFFICER

THE staff of each hospital center for reconstruction work is to include a "Special Educational Officer," whose duties are outlined in the approved recommendations, as follows:

The duties of this officer are to arrange for and supervise, under the direction of the commanding officer of the hospital, the means provided for the use of therapeutic work, such as curative workshops, classes, etc., to act as technical adviser to the commanding officer on this subject; to recommend the development of necessary means to keep patients employed so far as it is possible to do so; to make the necessary records of work done in his department; and to have immediate charge of any special training of vocational nature which can be given with the means at hand.

These officers are to be obtained from the ranks of teachers, vocational instructors, and others especially qualified, and will be selected for their training, experience, and peculiar fitness for the work. Where it is possible to get a man who is himself handicapped by some physical disability, and who has made a success in life, it is expected to do so.

By the employment of the measure proposed, it is expected not only to hasten the recovery of the patients, but that an environment will be created in military hospitals, which, while in no way relaxing the necessary discipline, will greatly promote contentment, and make the atmosphere of these hospitals such that the time spent in convalescence will pass most pleasantly because the minds and hands of the patients are properly occupied in profitable pursuits.

UNITED STATES SCHOOL GARDEN ARMY

ONE of the distinctive contributions of the schools of America toward winning the war for democracy is to be

thru the United States School Garden Army, which aims to enrol practically all boys and girls into a national army to increase and conserve food production. The great field which it is proposed to cultivate is that of school-supervised home garden work in cities, towns, and villages. The plan was conceived by Commissioner Claxton, strongly endorsed by Secretary Lane, approved by President Wilson, and organized by the Bureau of Education under the Department of the Interior. To meet the necessary expenses of administration, President Wilson allotted the sum of \$50,000 from his emergency fund of \$100,000,000.

There is in the aggregate an immense acreage of rich, tillable soil in the back and front yards and in the vacant lots of our cities, towns, and villages. And there are millions of patriotic boys and girls who are willing and anxious to be shown how they may contribute in some practical way to meeting the present emergency. The School Garden Army proposes to bring these two forces together and effect a noteworthy increase in our national food supply.

To add a human touch to the work, Secretary Lane has suggested that every garden soldier name his garden after some soldier he may know at the front. Thus will patriotic interest be intensified, and pride and enthusiasm in the work will be quickened.

A special Division in the Bureau of Education has been organized to carry on the work of the School Garden Army. At its head is J. H. Francis, superintendent of public schools, Columbus, Ohio, who has been given leave of absence by his board. Under Mr. Francis is a staff of five regional directors: Clarence M. Weed, northeastern states; Frederick A. Merrill, southern states; Lester S. Ivins, central western states; Cyril Stebbins,

western states; J. L. Randall, south Atlantic states. To Mr. Randall, the Bureau's specialist in school and home gardening, belongs much of the credit for the preliminary organization of the plan, and its practical testing out in a number of centers.

Under the regional directors are thousands of garden supervisors and teachers. The regional directors send to the teachers under their jurisdiction complete directions and instructions for planting, cultivating, harvesting, and conserving the crops in their localities. These instructions have been stated so simply and directly that any teacher who wishes to help in the cause, can easily direct a company of garden soldiers.

Each company, with a teacher-director at its head, is to have second lieutenants, first lieutenants, and captains, selected by the children and the teacher. Each soldier is entitled to wear the army insignia, a bar with the letters "U. S. S. G." on it. The insignia for the officers carry, in addition, one star for second lieutenant, two stars for first lieutenant, and three stars for captain. The full quota for one company is 150, which is regarded as the maximum number one teacher can direct in this work. Companies may form, however, with smaller numbers.

Boards of education are urged to give sufficient financial aid out of school funds to pay supervisors and teachers some extra compensation for this additional service. To do the job efficiently will require much time and effort after school hours and on Saturdays, as well as thru the summer months.

There will be many ways in which teachers of mechanical drawing and shop-work can help. They should lose no opportunity to give this work the encouragement and practical help that circumstances permit.

FEDERAL BOARD FOR VOCATIONAL EDUCATION

SINCE the last report in these columns the following bulletins have been published by the Federal Board for Vocational Education:



J. A. LINKE



R. J. LEONARD



H. B. SMITH



J. C. WRIGHT

Bulletin No. 5. Vocational Rehabilitation of Disabled Soldiers and Sailors.

Bulletin No. 6. Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors.

Bulletin No. 7. Emergency War Training for Motor Truck Drivers and Chauffeurs.

Bulletin No. 8. Same for Machine-Shop Occupations, Blacksmithing, Sheet Metalworking, and Pipefitting.

Bulletin No. 9. Same for Electricians, Telephone Repairmen, Linemen, and Cable Splicers.

Bulletin No. 10. Same for Gas-Engine, Motor-Car, and Motorcycle Repairmen.

Bulletin No. 11. Same for Oxy-Acetylene Welders.

Bulletin No. 12. Same for Airplane Mechanics—Engine Repairmen, Woodworkers, Riggers, and Sheet Metalworkers.

Copies of these publications may be obtained upon application to the office of the Board, Ouray Building, 8th and G Streets, N. W., Washington, D. C.

We are pleased to present in this number portraits of four more members of the staff of the Federal Board. J. C. Wright, formerly director of industrial education in the public schools of Kansas City, Mo., is district agent for industrial education for the western states, with headquarters

at Kansas City. R. J. Leonard, formerly professor of industrial education at the University of Indiana, is district agent for industrial education for the north central states, with headquarters at Indianapolis. J. A. Linke, formerly assistant

in State Boys and Girls Club Work, Indiana, is district agent for agricultural education for the same territory. H. B. Smith, formerly director of industrial education, State Teachers College, Albany, N. Y., is district agent for industrial education for the New England and north Atlantic states, with headquarters at New York City. A map showing the districts assigned to the regional offices under the Federal Board was published in the November, 1917, number of this MAGAZINE, p. 102.

COMMITTEE ON EDUCATION AND SPECIAL TRAINING.

THE Committee on Education and Special Training of the War Department has been engaged during the month in perfecting a plan of organization and procedure for training conscripted men. Channing R. Dooley, director of education for the Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., and member of the executive committee of the National Association of Corporation Schools, has been selected to serve as educational director for the Committee.

OPEN QUESTIONS

"There is more to be said on this subject."

HOW TO BEND WOOD

Dear Mr. Editor:

In response to Mr. Dalton's question regarding the bending of quartered oak:—

Use straight-grained American oak of No. 1 grade or better. Japanese oak will not give you satisfactory results, as the fiber is short and the wood lifeless.

Use only *air-dried lumber*. Material known in some parts of this country as "bending oak" is really the best, as it often contains as much as 25 per cent. moisture, which adds greatly to the bending qualities; but if the material is not thoroly dried after bending, it will not take the stain or dye like the drier stock used in the chairs.

Practically all bent work straightens somewhat after being removed from the forms, some pieces straightening more than others; furthermore, this straightening does not take place all at once. While one piece may take its final "set" in a week, another may continue to straighten for two or three weeks, depending much upon the thoroughness of the drying before the wood is removed from the forms.

Oak 1" thick, containing considerable moisture, will be found quite pliable if soaked in boiling water about an hour, while air-dried oak will often require soaking for two or three hours. Kiln-dried oak is not satisfactory for bending, and should not be used for anything except very subdued curves.

When possible, avoid using solid forms. Mark out the shape of the rocker on the floor, and secure blocks along the lines several inches apart, and bend the rockers between them. Unless there are very good reasons for bending the rockers and other chair parts, I would strongly recommend that the parts be band-sawed.

Technical High School, J. E. DOREN,
Oakland, Cal. Instructor in Carpentry
and Mill Work.

Mr. Editor:

The pieces of wood that are to be bent should be good, clear, "live" lumber. Lumber from a tree that seasoned on the stump will not bend.

A steaming box must be made, in which to steam the pieces of wood to be bent. Such a box can be easily made by nailing four wide boards together into a rectangular or square

box. Cypress is a good wood for this box. The box must have the length sufficient to take in the length of the stock to be bent. Both ends must be squared, so that the box can be tightly closed by clamping lids over the ends. It is better to use clamps than nails, as the nails are apt to ruin the box after it is used a few times.

In schools where live steam is not available, a tea-kettle will serve the purpose for a steam generator.

A hose is attached to the spout of the tea-kettle, and also attached to the steaming box by a short piece of gas pipe turned in a bored hole.

One end of the steaming box should be placed a little lower than the other, and a small hole bored in that end. This will permit the water of condensation to escape.

You should never crowd the steam generator so fast that the steam will escape from the box. The pieces of stock should be so arranged in the box that the steam can get to all parts easily.

The forms on which the pieces of steamed stock are to be placed and bent, should be ready and the clamps set before the pieces are taken from the box. When taking the stock from the box, do not lose any time in securing it to the form. Do not remove more than one piece of steamed stock at a time, as it must be bent immediately while hot.

The length of time to allow for steaming depends upon the size of the stock. Stock $\frac{3}{4}$ of an inch in thickness should be left in the box at least six hours by the method just explained. Where steam can be forced into an absolutely air-tight box, one hour is sufficient.

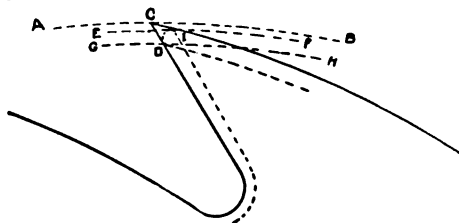
After the stock is thoroly dry it may be removed from the forms. Wood properly steamed will straighten but little after removed from the forms.

Tulsa High School, J. W. ORMAN,
Tulsa, Okla. Instructor in Cabinet Making.

HOW SHOULD A BOY BE TAUGHT TO FILE A SAW?

Several methods of saw filing are used by woodworkers. Filing with and against the set, and on the face and back of the tooth are practiced. The following method has been used with good results for several years.

A saw should be filed in the direction of the set. Only a small amount of metal needs to be removed to secure a cutting edge, and there is no chattering. The wire edge produced is removed during the first few strokes of the saw when in use. Manufacturers sometimes file against the set in the first filing, because quite a bit of metal must be removed to bring the tooth to the proper shape. This quickens the process.



The tooth should be sharpened by filing on the face or front side of the tooth because it is more economical. Sharpening the tooth by filing on the back decreases the width or diameter of the saw blade rapidly.

By reference to the drawing, line AB represents the original diameter of the saw. I is the position of the point of the tooth after dressing on the face side. D is the position secured by dressing on the back. The distance between the lines AB and EF is the amount of blade lost by filing on the face, while the distance between lines AB and GH represent the loss by filing on the back of the tooth. Sometimes it is necessary to file the back of an irregular tooth to restore it to the original shape or spacing.

Miami University, —FOREST T. SELBY.
Oxford, Ohio

OVER-TIME WORK.

To the Editor:

In the February issue, E. W. J. asks if "after school" work be proper. My experience has led me to say "no" to 95% of my pupils. I started with the willingness to stay with them till I had to stop it for the following reasons:

a. In their eagerness to finish a project, which "over-time" fosters, they leave tool marks and many little signs of haste which demand either refinishing or passing slovenly work.

b. Often a careful workman who would not be guilty of the above, will make errors in construction or method if he be left alone a few minutes. A teacher after hours is likely to feel more free to leave his extra class than at

other times, and this always leads to grief.

c. While some wish to work over-time, others do not, and this leads to inequality in the regular classes.

There are many reasons for refusing over-time work, and only one for allowing it,—that of showing your superiors and your boys that you are not afraid of work; and there are more profitable ways of doing that.

Canutillo, Tex. —JAMES K. SHALLENBERGER.

AFTER SCHOOL WORK

The boys are certainly interested in their work. The eighth grade class comes on Tuesday and Thursday from one o'clock until two-thirty. I have the same periods vacant on Friday, so some of the boys asked me if they might come over on that day also if they could get the consent of the principal. I told them "yes" and when the time came, the whole class was there ready for work. Now they want to come over during those periods every week.

I open the shop on Saturdays, and every Saturday I have about every bench taken by boys from the different grades. Those who are having drawing come over and put in extra time on Saturdays and thru the week. Even the lower grade boys come over on Saturday to see if there is an extra bench vacant. If there is, I always give them something to do.

I enjoy my work very much, and I am striving to make it as interesting as possible.

Watseka, Ill. —ORMAL HIGGINS.

WAGES PAID TO BOYS WORKING AFTER SCHOOL

Mr. Editor:—

This is the answer of Evansville, Ind., to the question asked by C. L., page 181, in the January number:

Boys of recognized ability, 15 cts. per hour.

Special work requiring unusual skill, sometimes, 25 cts.

Boys who must be closely watched, and some who are used mainly as helpers, get 10 cts. and 12½ cts. per hour.

We have a rule that a boy cannot expect to receive school credit and pay for the same work. Work done in school hours then is not paid for.

In the past four years we have paid out to boys more than \$1,000.

Instructors who work overtime and in vacations get 40 cts. to 50 cts. per hour, depending on the responsibility of position.

Evansville, Ind. —EUGENE C. GRAHAM.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

YARN HOLDER AND YARN WINDER

THE accompanying drawings and photographs illustrate two very timely suggestions. The projects were made by seventh grade pupils for the Junior Red Cross. The yarn holder enables any one to wind a ball of yarn with ease, while the yarn winder simplifies the process by winding the yarn when the crank is turned.

Pittsburg, Pa.

WARREN V. HARTZ.



YARN HOLDER

SHOP PROJECTS FOR THE GRAMMAR GRADES

The following projects have been contributed by Harry W. Anderson, of Vinton, Iowa:

PRINTING MACHINE

If the reader has used the common hand-printing frame, he will appreciate the advantages of a machine. Such a one as is described can be made with a little effort and at an expense of 75 cts. to \$1.00, for most of the electrical equipment can be found around the home.

The wood should be $\frac{1}{4}$ " white pine, poplar, or basswood. The opening is cut before the material is smoothed and squared.

With a little study of the detail in the drawing, the method of putting on the lid and the frosted glass will be apparent. A good coating of felt on the under side of the lid will hold the prints firmly in place without

breaking the glass. To hold the glass in place, four L-head brass screw-hooks are put into the wood beside the glass with the straight head extending out over it. To take out the glass, turn the head around. In order to turn the screws into the wood, a curved portion (see side view) must be cut out of the top step, as shown in "detail," down to the next lower or level with the top of the glass. As the lid, when closed, comes down to this level, a semi-circular hole will have to be cut out of it deep enough so that the head of the screw does not strike.

As soon as the box is put together, a "filler" coat should be applied to the inside which, with two coats of white enamel, will form a good reflecting surface. The outside may be stained or colored to suit the individual taste.

The lamp-cord enters at the back and the double-throw switch is located on the left side in the lower right-hand corner. The main



YARN WINDER

light stands erect in its porcelain socket. It is a "40-Watt Mazda B-Coil," and is an excellent lamp for this service, as the light is all thrown up. The secondary, or dark lamp, is a very small candle-power carbon lamp. If possible, the lamp should be coated with red; otherwise red paper, glass or other suitable material may be put over the opening in the front of the box.

One main from the circuit is connected to the center of the switch on which is pivoted the handle. The other main is attached to one side of the big light and to one side of the small light. The terminal to the left of the center on the switch is connected to the second side of the large lamp, while the terminal to the right is connected to the other side of the small lamp. In this way either lamp may be lighted without the other, or both may be off.



PHOTO PRINTING MACHINE

LIST OF MATERIALS

- 4 pieces $9\frac{1}{2}$ " x $7\frac{3}{4}$ " for the sides.
- 1 piece $8\frac{3}{4}$ " x $7\frac{3}{4}$ " for the bottom.
- 1 piece $8\frac{3}{4}$ " x $7\frac{1}{2}$ " for the top.
- 8 ft. Lamp cord.
- 1 40-watt Mazda B-coil lamp.
- 1 2-c.p. Carbon lamp.
- 1 Socket plug.
- 1 Lamp socket (for small lamp).
- 1 Double-throw switch.
- 1 Stationary porcelain base (for large lamp).
- 1 Hook and screw-eye.
- 4 Brass L-head screws.
- 1 piece $7\frac{3}{4}$ " x $6\frac{7}{8}$ " Frosted glass.
- 3 pieces $1\frac{1}{2}$ " x $\frac{3}{4}$ " Small brass hinges (top of lid).
- 2 pieces 2" x 1" Brass hinges (lid to box)

FLOWER OR PLANT STAND

This stand makes a good holder for ferns or other similar plants. The jar is held firmly in place and the fronds have a good chance to hang down. White pine or cypress are

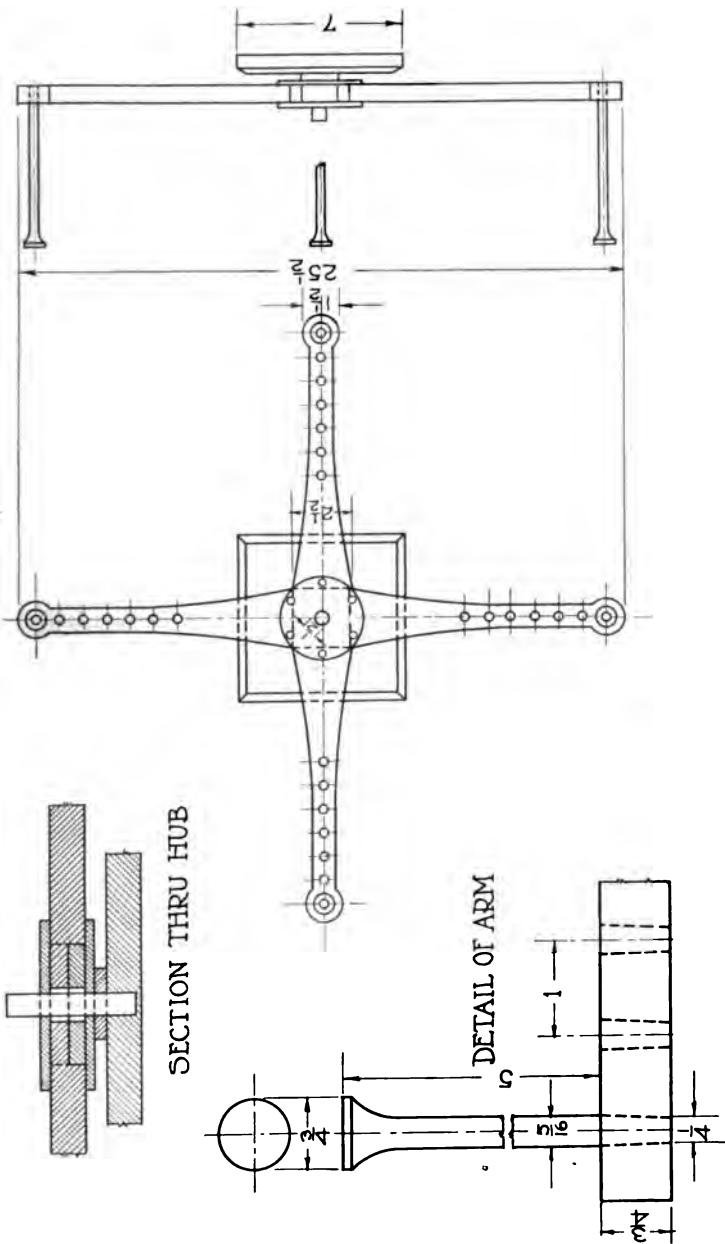
suitable woods for this stand. The cross-pieces which constitute the base are cut first. They are fitted together with a cross-lap joint and fastened together with two 1" flat-head screws. Plane the uprights to size and tack the little blocks, which are to be at the top end, in place. The two cross-pieces which hold the flower-pot or plant jar should be cut and fitted with a cross-lap joint in the same way as the base was cut. Bore the holes for the

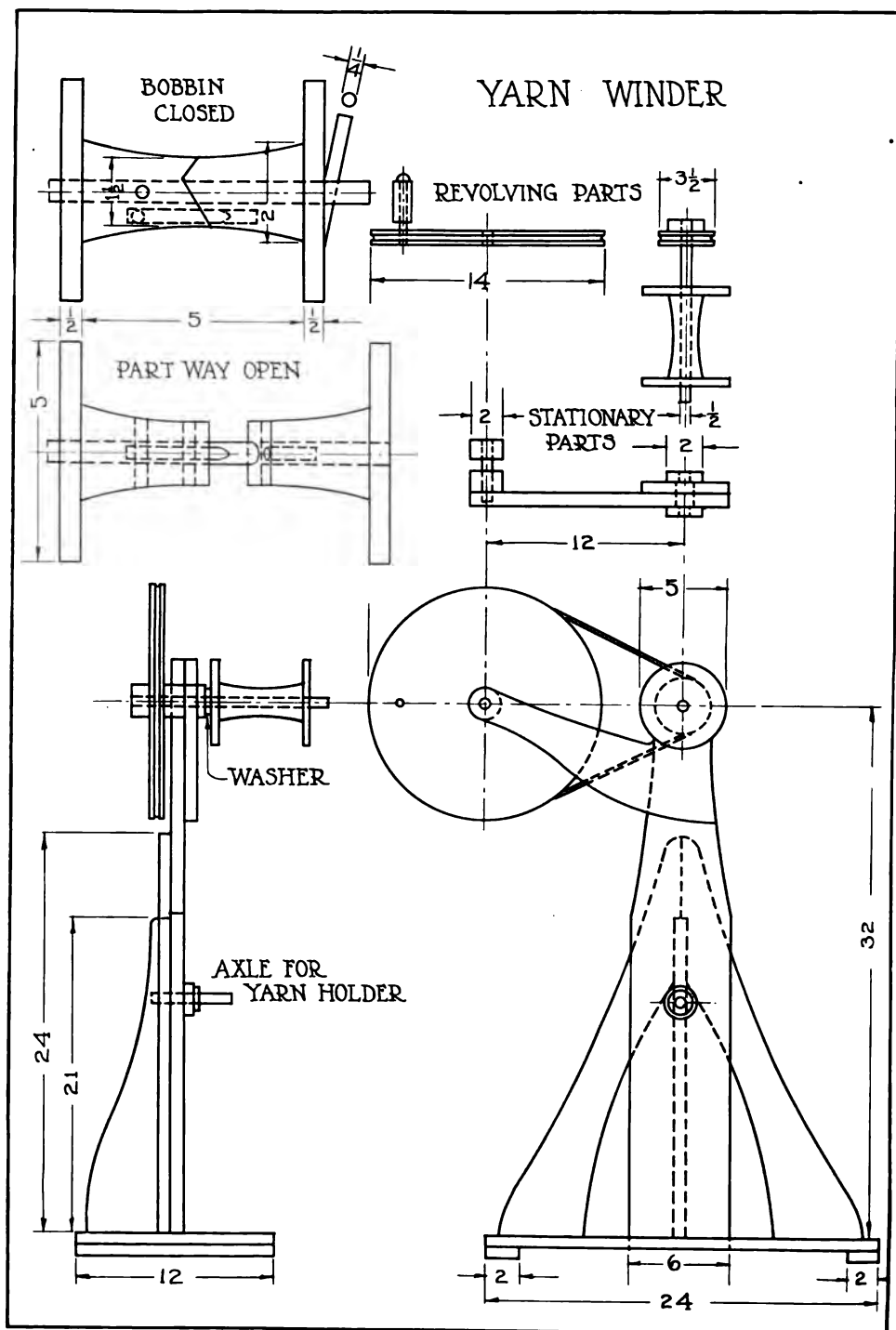


PLANT STAND

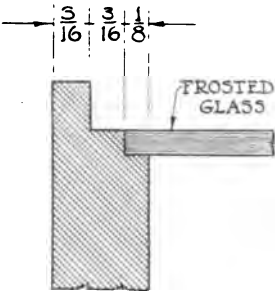
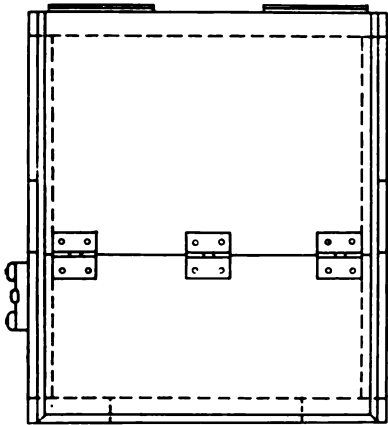
screws and then sand the pieces thoroly. The depth of the jar will determine the placing of the cross-pieces. The pieces should now be assembled preparatory to finishing. Two coats of white enamel undercoating should be applied first, allowing plenty of time for each to dry. A coat of enamel should then follow, taking care to spread it evenly. The jar and dish should also be painted with one or two coats.

YARN HOLDER

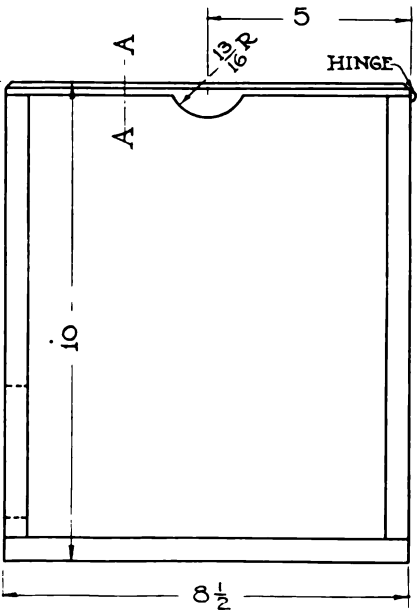
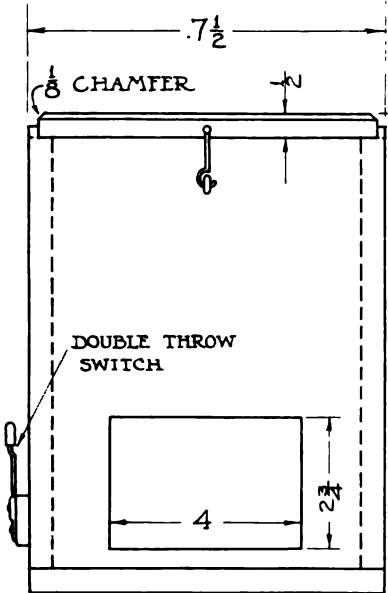


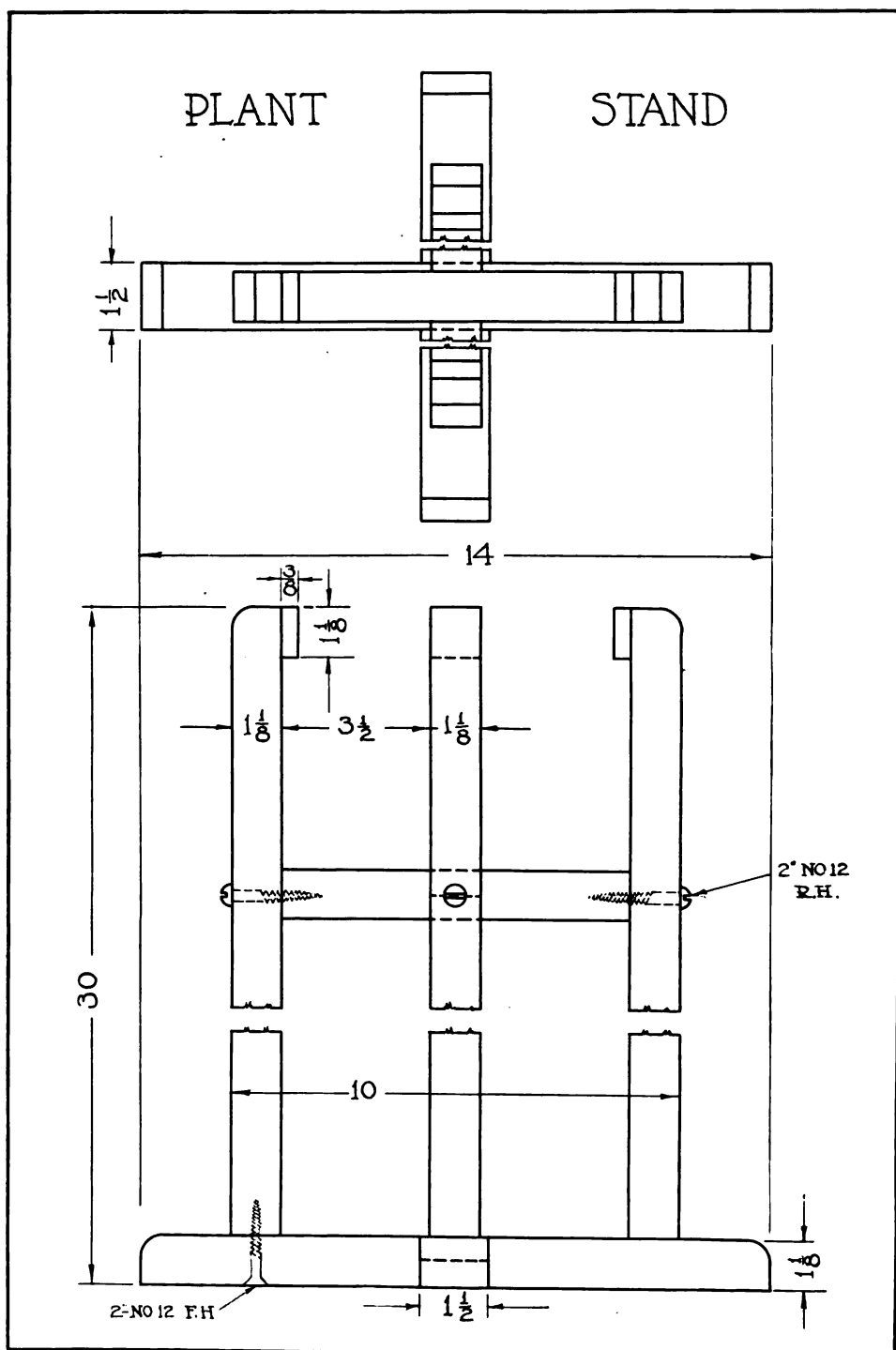


PRINTING MACHINE



DETAIL THRU A-A





CURRENT PUBLICATIONS

Vocational Education. Compiled by Emily Robinson. The H. W. Wilson Company, New York, 1917. Size, 5 x 7½ in.; 303 pages; price, \$1.25 net.

This is a source book for students and teachers, or for anyone who wishes to read some of the most significant statements that have come out in the discussion of vocational education during the past few years. It contains selected articles by John Dewey, David Snedden, Eugene Davenport, Paul H. Harms, Frank M. Leavitt, Samuel Gompers, Arthur D. Dean, Mary Schenck Woolman, Edwin G. Cooley, Frank V. Thompson, Charles A. Prosser and many others. These selected articles are preceded by a bibliography that is more comprehensive than the selections printed.

Such a book is of special value because it brings together in permanent form, material that otherwise would be lost or forgotten.

Principles of Science Teaching. By George Ranson Twiss. The Macmillan Company, New York, 1917. Size, 5½ x 8 in.; 486 pages; price, \$1.40.

"This book is intended primarily to be used in the instruction of young men and women who are preparing themselves in colleges and normal schools for careers as teachers of one or more of the natural sciences."

This book is on the special pedagogy of a subject so near kin to manual training that it ought to be helpful to teachers of the manual arts.

Domestic Architecture. By L. Eugene Robinson, assistant professor of rural architecture, Oregon Agricultural College. The Macmillan Company, 1917. Size, 5 x 7½ in.; 378 pages; price, \$1.50.

This is the first book we have seen that seems to cover the field of home planning as it is coming to be considered in our best courses for advanced students in household arts. It covers both the general and the technical considerations that enter into the planning and furnishing of an American home. Science as applied in heating, ventilating, lighting and plumbing is treated along with art as applied in the selection of materials, style, furnishing, finishes, and garden planting. Cost is also treated.

While the book covers the field of a course for students in household arts, it is treated in such a way as to be useful to anyone who is planning to build or remodel a home, or who for any reason, is interested in the practical problems of home planning. It is illustrated with sketches and plans.

The Cadet Manual, by Major E. Z. Steever III, and Major J. L. Frink. J. B. Lippincott Company, Philadelphia, 1918. Size, 5½ x 8 in.; 317 pages; price, \$1.50. This is an official handbook for high-school volunteers in the United States. It gives detailed instruction in the elements of military science adapted to boys of high-school grade. It is a very timely book.

School and Home Gardening, by Mary C. Davis. J. B. Lippincott Company, Philadelphia, 1918. Size, 5 x 7½ in.; 353 pages; price, \$1.28 net.

This book is written for boys and girls and for the adult home gardener. It is not only correct in the application of scientific principles, but it is written in good style and well illustrated. It ought to help hundreds of vacant-lot gardeners to get better results this summer.

Lessons in Community and National Life. A series of leaflets published by the U. S. Bureau of Education in co-operation with the U. S. Food Administration. They have been edited by Dr. Charles H. Judd, director of School of Education, University of Chicago, and Leon C. Marshall, dean of the School of Commerce and Administration, University of Chicago. These leaflets are of special interest to industrial teachers. They are sold at the following prices: 1 copy, 5c; 2 or more copies, 3c each; 100 copies, \$2.00; 500 copies, \$5.00; 1,000 copies, \$9.50. Some of these leaflets are for the use of high-school students, others for the upper grammar grades, while still others are for students of intermediate grades.

How to Study, by George Fillmore Swain. Published by McGraw-Hill Book Co., New York; 5 x 7½ in.; 65 pages; price, 25 cents.

Certain fundamental principles in reference to study are formulated and set forth in a brief

but simple manner. It is intended primarily for college students. Teachers reading the book and passing its precepts on to students will render a real service.

The book treats the subject under five headings: (a) Proper mental attitude, (b) studying understandingly, (c) system, (d) mental initiative, (e) habits of work.

Third Year Mathematics, by Ernest R. Breslich. The University of Chicago Press, Chicago, 1917. Size, $5\frac{1}{4} \times 7\frac{3}{4}$ in.; 369 pages; price, \$1.00, net. This is the third book in Mr. Breslich's series of mathematical textbooks for secondary schools. It is a general course but not of the old type; it presents "reconstructed mathematics."

A book of "Logarithmic and Trigonometric Tables and Mathematical Formulas" to accompany the above is published in a separate volume. The price of this is 75 cents.

RECEIVED

Statement of Plans and Policies, State Board for Vocational Education, Department of Education, Frankfort, Kentucky. A 37-page pamphlet.

Vocational Education in the Light of the World War, by Professor John Dewey, Columbia University, New York. A paper published by the Vocational Education Association of the Middle West. L. W. Wahlstrom, secretary, Francis W. Parker School, Chicago, Illinois.

From School to Work, by Margaret Hutton Abels. Published by the Children's Bureau of the U. S. Department of Labor, Washington, D. C. A study of children leaving school under sixteen years of age to go to work in Waltham, Massachusetts.

Forty-seventh Annual Report of the State Board of Education of Rhode Island. This contains a report of the Rhode Island School of Design.

The Public School System of San Francisco, California. Bulletin No. 46, 1917, issued by the U. S. Bureau of Education, Washington, D. C. A report to the San Francisco Board of Education of a survey made under the direction of the U. S. Commissioner of Education.

War Garden Hot Beds, by C. E. Durst. Circular No. 215, published by the Agricultural Experiment Station, University of Illinois, Urbana, Illinois.

Mechanical and Technical Training for Conscripted Men. Bulletin No. 4, issued by the Federal Board for Vocational Education, Washington, D. C.

Emergency Training in Shipbuilding. Bulletin No. 3, issued by the Federal Board for Vocational Education, Washington, D. C.

Fundamentals of Illumination Design. Bulletin 7C, issued by the Engineering Department of the General Electric Company, December 20, 1917. This presents a simple and interesting discussion of the art of illuminating by artificial means.

Vocational Education Association of the Middle West. Report of the third annual convention held at the Auditorium Hotel, Chicago, January 18th, 19th, and 20th, 1917. L. W. Wahlstrom, secretary, Francis W. Parker School, Chicago.

Emergency War Training for Motor Truck Drivers and Chauffeurs. Bulletin No. 7, issued by the Federal Board for Vocational Education, Washington, D. C.

Summer Sessions of City Schools, by W. S. Deffenbaugh. Bulletin No. 45, 1917, issued by the U. S. Bureau of Education, Washington, D. C.

Suggested Outlines in Woodwork and Drawing for Grades and High Schools, by J. M. Dorrans, state supervisor of manual training in Wisconsin. Issued by C. P. Cary, state superintendent of public instruction, Madison, Wisconsin. This helpful pamphlet of 25 pages will be of interest to a large proportion of our readers. Besides the outlines in woodwork and drawing, it contains a preliminary statement in regard to work in metal and cement.

Report of Convention of Eastern District of International Association of Teachers of Printing. R. A. Loomis, secretary, William L. Dickinson High School, Jersey City, N. J.

Desk Calendar, 1918. Printed by the boys of the Vocational School, Holyoke, Massachusetts.

Sloyd in India, by Gustaf Larsson. Reprint from the *Sloyd Record*. A 28-page illustrated pamphlet.

Food Problems, by A. N. Farmer and Janet Rankin Huntington. Published by Ginn & Company; price, 27c. This book is designed for use in the sixth, seventh, and eighth grades. It furnishes problems in arithmetic presented in good pedagogic form.

MANUAL TRAINING MAGAZINE

JUNE, 1918

A TRUMPET CALL



TRUMPET sings, and other songs are still;
The close-locked ranks fast gather and are gone,
Leaving a myriad stars in casements hung,

As symbols of the spirit which doth thrill

A mighty nation, as it bends its will

To aid that Cause, which Freedom must see won.

A trumpet sings; it bids the valiant—Come!

Your country calls; the laggard serves her ill.

But what of those who march not in the van.

How shall they serve who yet must bide at home?

Quick to the thousand tasks which must be done;

Each to his post—Let each now play the man.

And what for song fit for the trumpet's tone?

Why—raise the battle cry of "Carry on"!

—JAMES PARTON HANEY

RED CROSS PROBLEMS IN SHOPWORK

CHARLES A. BENNETT.

DURING the past two months this magazine has made a special effort to gather together shop problems approved by the officials of the American Red Cross. It has done this in order to assist shopwork teachers and supervisors who, with their patriotic boys and girls, are trying to help win the war. The results appear in the following pages.

For furnishing drawings, information and cordial assistance, we are especially indebted to Miss Justine R. Cook, general supervisor of Red Cross House Furnishings, whose headquarters is in New York City; also to James N. Rule, Principal of Schenley High School, Pittsburgh, Pa., and Chairman of National Committee on Boys' Work Bureau of Junior Red Cross; to Lewis Gustafson, Superintendent of David Ranken, Jr. School of Mechanical Trades, St. Louis, and Supervisor of Manual Training Activities for Southwestern Division of Junior Red Cross; to Edwin G. Cooley, Chicago, Director of Junior Membership and School Activities of the Central Division of the Red Cross; to Miss Elizabeth M. Heath of the Editorial Division of the Bureau of Junior Red Cross Membership, Washington, D. C.; and to William J. Bogan, principal of Lane Technical High School, Chicago.

In the first letter received from Miss Cook, she stated that the articles are to be made for Red Cross use only in schools which have affiliated themselves as auxiliaries of the Junior Red Cross.

The designs for the 8-ft. table, the dressing table, the folding table, the taboret, the screen, the bench and the lamp were prepared under the direction of F. W. Boland, manual training director, Schenley High School, Pittsburgh, Pa. The 6-ft. table was designed by students of the William Dickinson High School, Jersey City, N. J.

Owing to the fact that the drawings were made too large in size to suit our pages, all of those shown relating to Red Cross houses have been redrawn by Franklin G. Elwood, instructor in architectural drafting at Bradley Institute.

The following description of the Red Cross Houses has been prepared by Mr. Rule:

THE RED CROSS HOUSE AND ITS FURNITURE

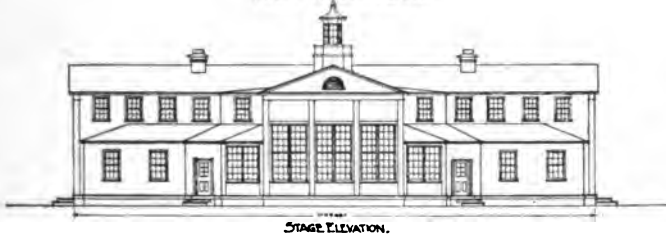
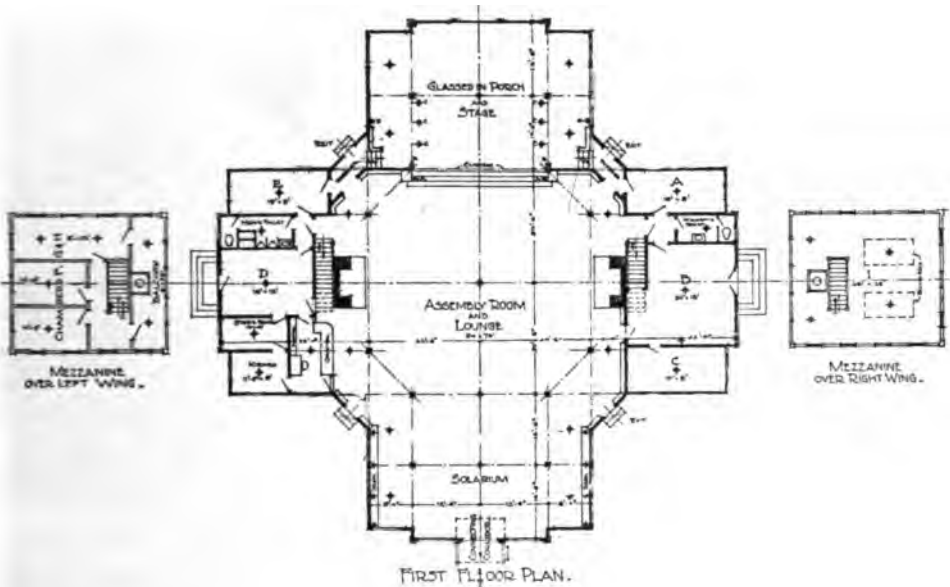
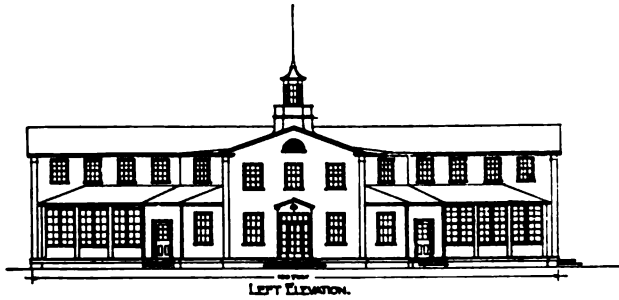
Fifty convalescent houses are to be built this spring in connection with fifty base hospitals, located in the various camps and cantonments in the United States. The construction and furnishings have been entrusted by the War Department to the Red Cross, the houses to be known as "Red Cross Houses." The Red Cross school auxiliaries of the country are asked to assist in supplying the furniture so far as they are able.

These houses are to be in no sense hospitals, tho each will be directly connected by a passage with the base hospital. They are rather rest homes for the use of those men who have been ill or wounded and who, recovered from their illness, are not strong enough to return to the strenuous life of the barracks.

The ground plan on the following page shows that each house is built in the familiar form of the Red Cross.

As the visitor enters he sees a long room stretching to the other end of the building where the daylight streams in thru the glass windows of a slightly raised sun parlor. The walls rise straight to the raftered ceiling, and on either side are balconies from which open off cheery bedrooms for the use of families of sick men or nurses. Downstairs, on either side, the light from huge fireplaces casts a warm glow over the cream walls and the groups of writing tables, lounges and Morris chairs. This heavier furnishing is of the same dark brown as the woodwork, while the smaller articles, such as screens, book ends, and taborets that help to make the room attractive are of contrasting greenish blue. The floor is covered with woven rugs of the same blue and a dull orange, while the windows are shaded with orange curtains bound in black.

This main room serves a double purpose. In the daytime it is a writing or smoking room



RED CROSS HOUSE
AMERICAN NATIONAL RED CROSS
WASHINGTON D.C.

ISSUED BY OFFICE OF
 CHAS. E. FOX, ASSOCIATE DIRECTOR
 IN CHARGE OF CONSTRUCTION
 JANUARY - 1916.

for the convalescents. In the evening the furniture can be removed and folding chairs to seat 500 people brought in. The sun parlor at the end of the room becomes a stage. Here entertainments, moving pictures or concerts may be held for the inmates of the base hospital.

Opening off from the main hall on each side are administration offices, easily transformed into dressing rooms when a play is to be staged. Here is the headquarters of the matron or nurse.

These houses are now in process of construction and will be finished by summer. Allotments of quotas of furniture have been made to schools in every part of the United States maintaining efficient manual training shops. June 1 is date set for completion of all quotas, and it is expected that all furniture will be in place in the Red Cross Houses of the several cantonments by July 1 at the latest. All work is being done under the general supervision and direction of the National Committee on Boys' Work of the Junior Membership, American Red Cross.

The aim of this committee is to mobilize the resources of the manual training shops of our schools, both elementary and high, for community and national service in the promotion of the Nation's war program. The school shops everywhere are already rendering a fine community service upon their own initiative in the equipment of Red Cross work rooms. The committee on Boys' Work hopes to make the helpful experiences of each locality available for the mutual use and profit of all the schools desiring to cooperate in war service activities. A very definite and splendid program of National service is rapidly nearing completion and will be ready for announcement, it is hoped, within the present month. Plans and specifications and quotas of work will be prepared and made ready for distribution before September 1. Schools desiring to co-operate in National service work should ask their local Red Cross Chapter School Committee for an allotment of a quota when issued.

The following quotation from a letter sent by Mr. Gustafson to chairmen of chapter school committees in his division reveals how certain business details are being handled:

The procedure suggested is for each Junior Red Cross chapter to appoint a supervisor of

manual training activities for the chapter. This supervisor will be given authority, under regulations to be issued later, to purchase the necessary raw material, and to send the bill to the division supervisor for payment by the division manager out of Red Cross funds. It is not the intention to ask the schools to donate this material; a donation of all or part of it will of course be that much of a contribution to the cause.

In Mr. Rule's statement he refers to quotas allotted to several divisions. The following is the quota of the Southwest Division to be made before June 1, 1918:

16 Red Cross Tables, 8-ft. top (Drawing shown herewith).

18 Red Cross Tables, 6-ft. top (Option allowed between two designs).

32 Benches (Option allowed between two designs).

All of the above may be made of oak, birch, yellow pine, ash, poplar or cypress.

105 Camp Chairs (Painted birch, ash or beech).

42 Folding Tables (Painted yellow pine, poplar, ash or oak (Option allowed between two designs)).

14 Wood Screens.

4 Andirons (Bessemer steel or iron).

4 Spark Screens (Iron frame, wire mesh).

21 Lamps (Wood, iron or pottery; color of pottery or painted wood as per sample).

21 Shades (Parchment or fabric; color as per sample).

42 Inkwells and Blotter Ends (Wood painten; glass wells; color as per sample).

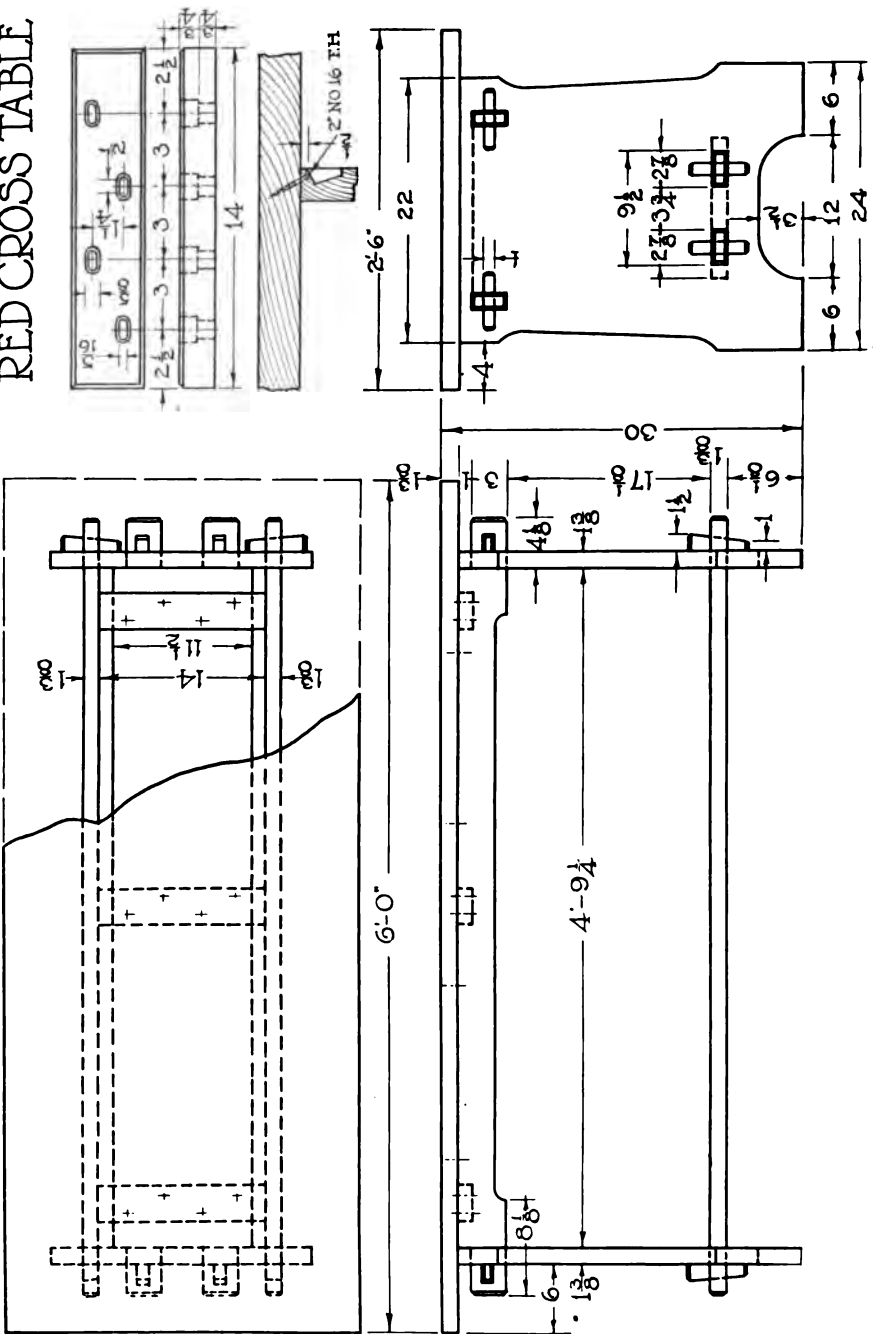
32 Rugs (Woven or braided; color as per sample).

32 Quilts (Rose and white, or blue and white, or green and white, per sample).

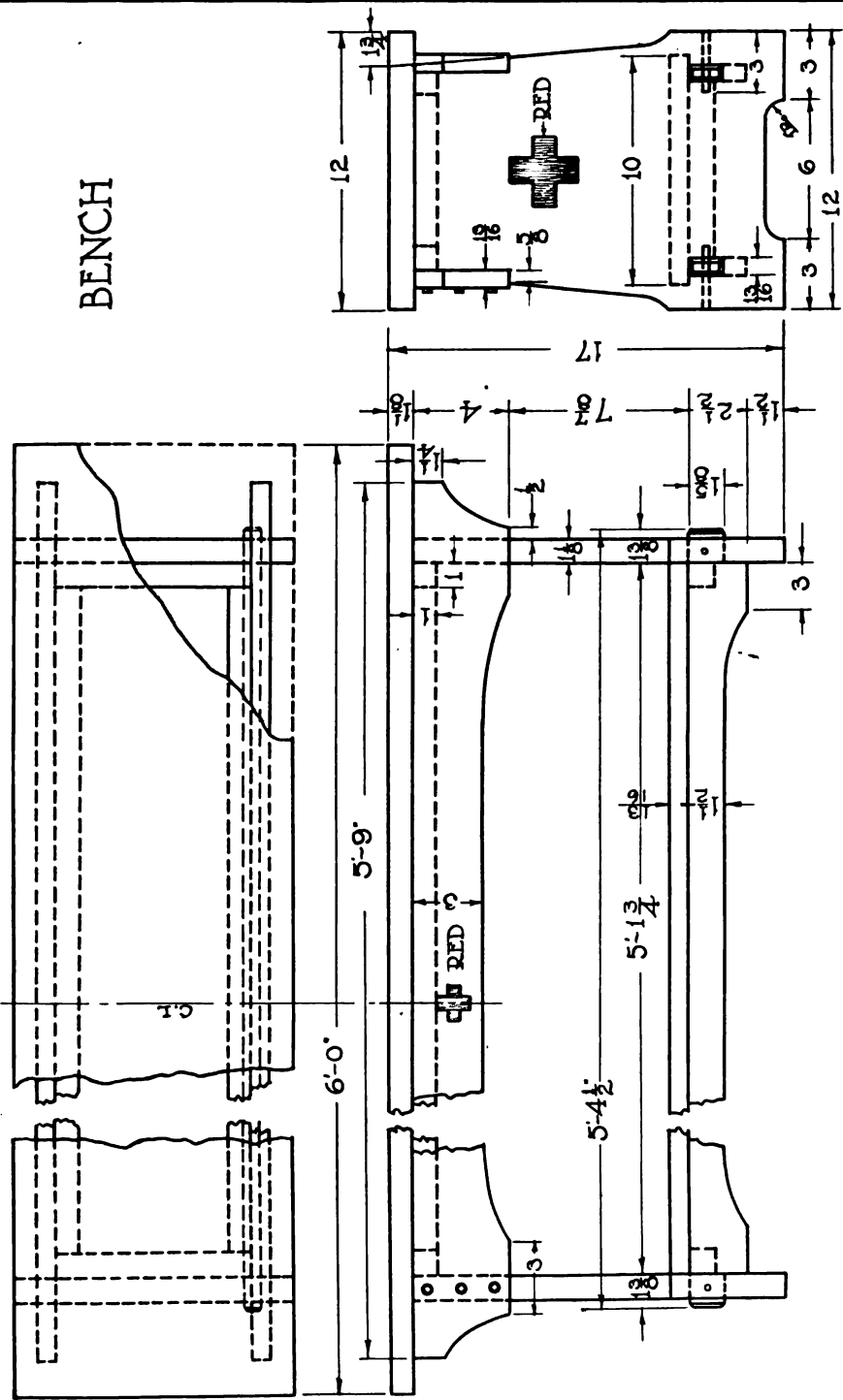
This list shows that an opportunity is given to work not only in wood but also in several other materials.

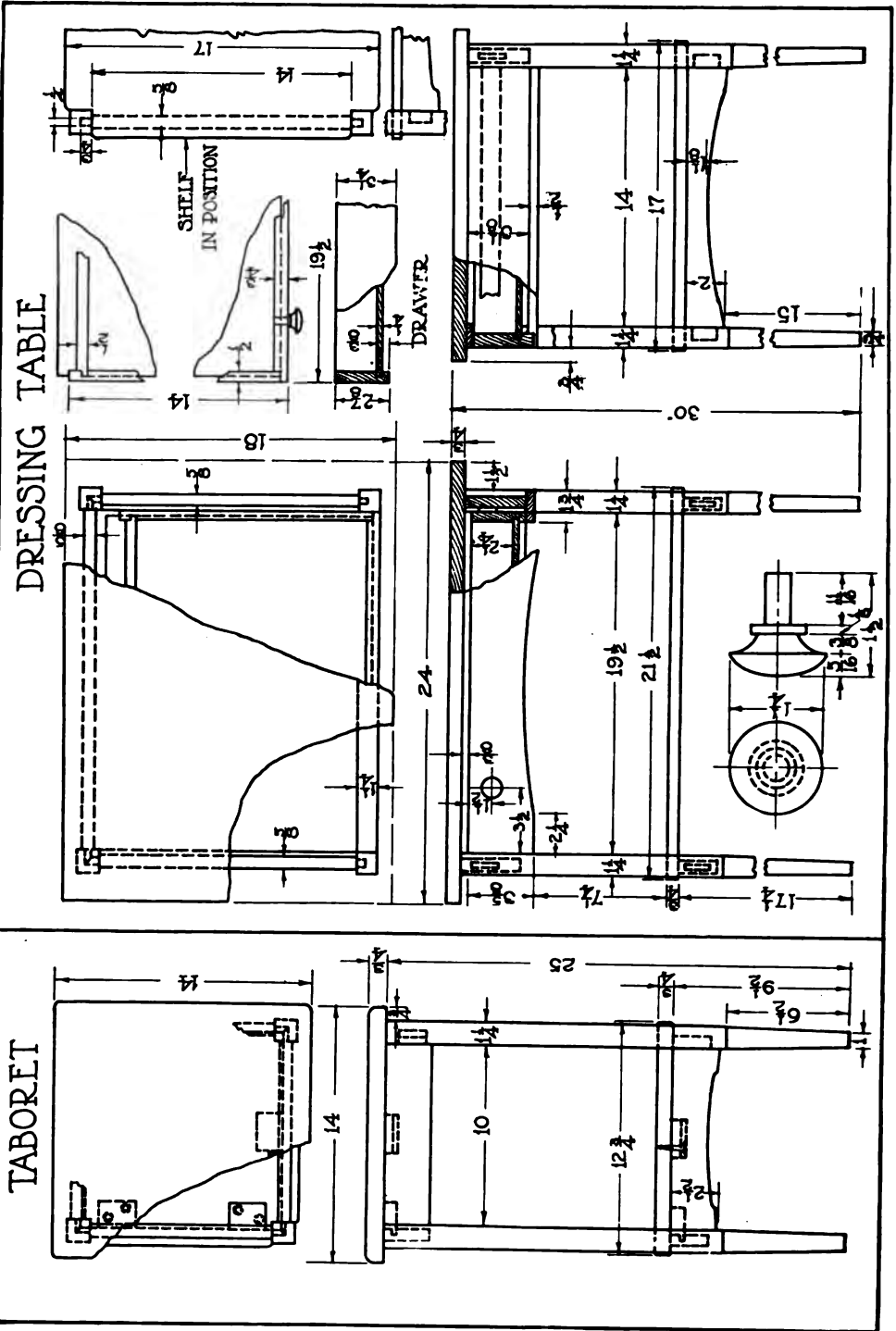
On each blueprint is a list of materials required in making the object. Accompanying each blueprint, or on the blueprint itself are specifications. The following are the specifications for making the Red Cross Table (drawing shown herewith).

RED CROSS TABLE

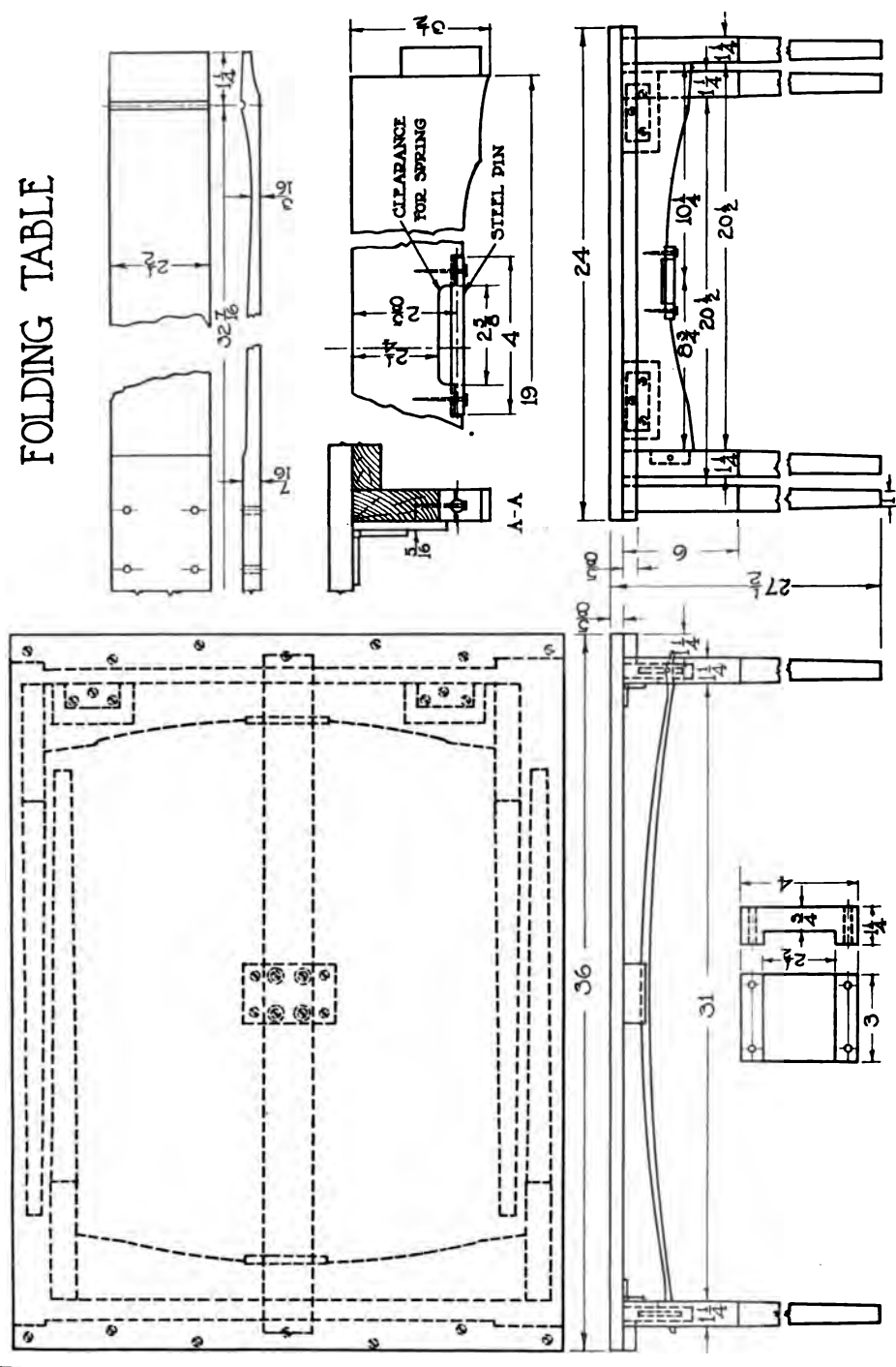


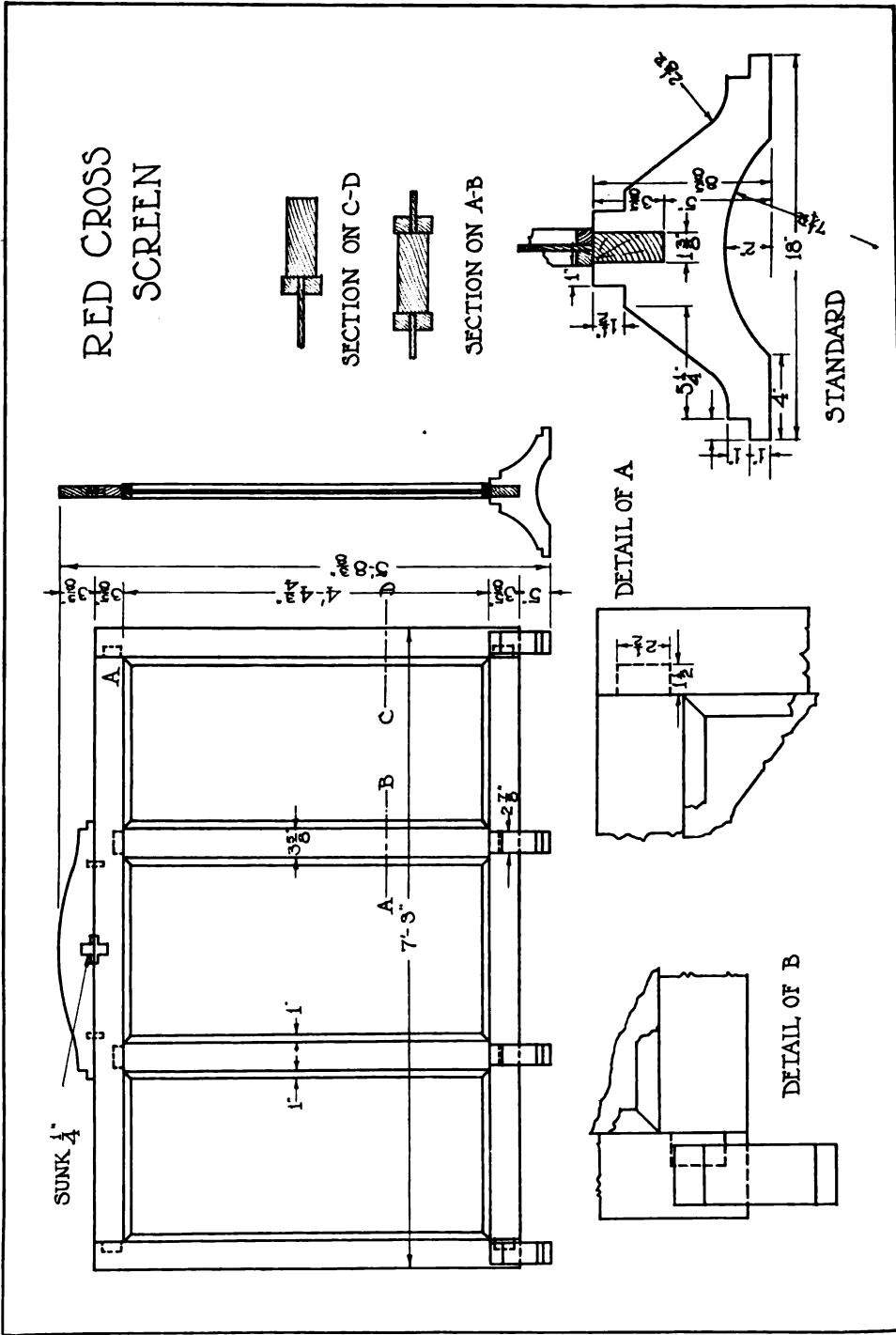
BENCH

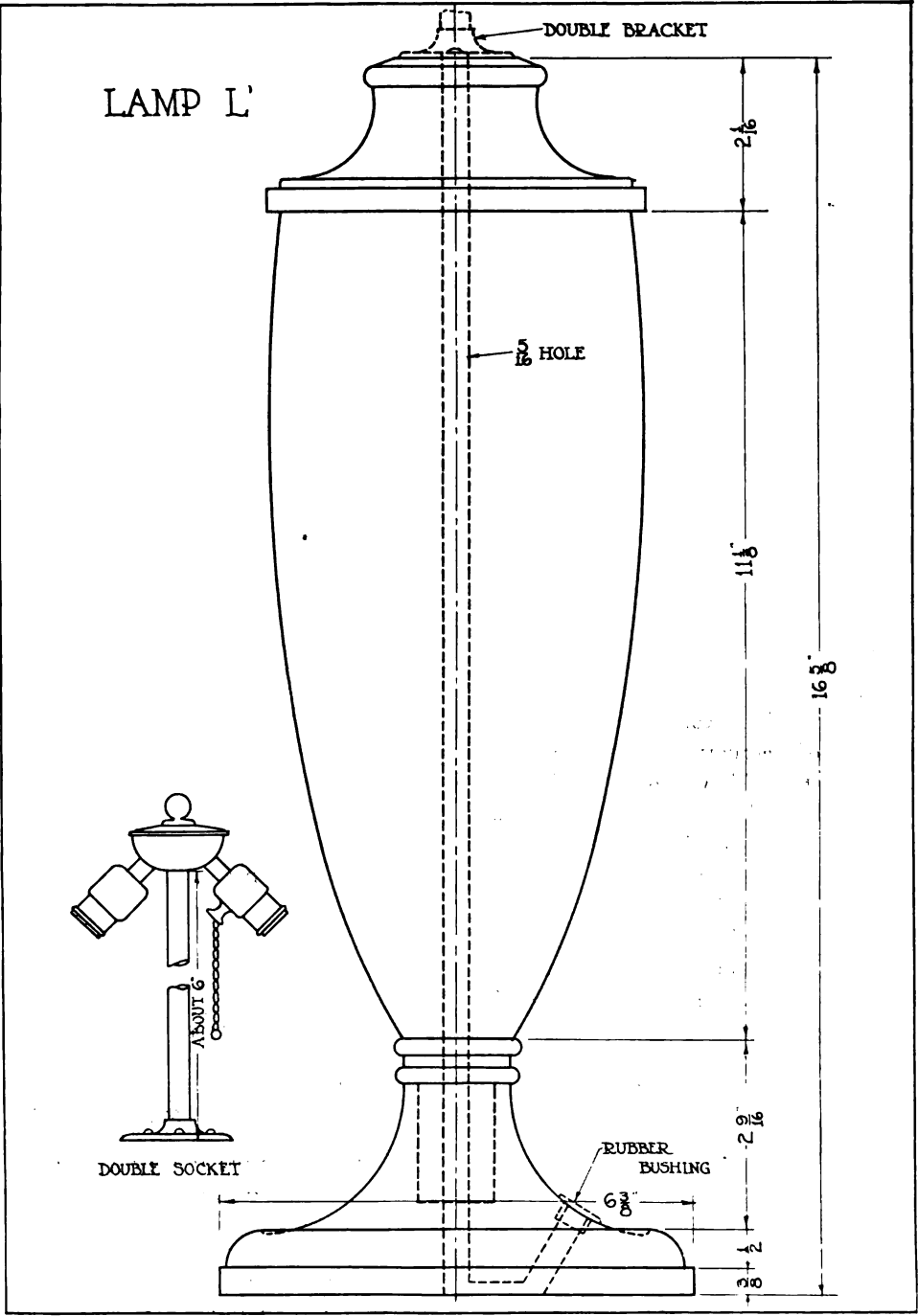




FOLDING TABLE







SPECIFICATIONS

Material—

This table may be constructed of any of the following woods: Yellow pine, poplar, cypress, oak or ash.

Workmanship—

None but the best workmanship should be accepted. Top should be doweled and glued up, stock used in top should not be more than 9" wide; Tenons on uprights should fit in battens accurately. Keys should fit mortises in side rails accurately.

Finish—

Table should be scraped very carefully and sandpapered smooth and given one coat of brown oak stain (Sherwin Williams' Hand Craft or equal), properly wiped off and followed with two coats shellac. Sandpaper with 00 sandpaper between each coat. Wax.

Shipping—

Packing and shipping directions will be furnished later or can be had by addressing The American Red Cross, 222 Fourth Avenue, New York.

FURNITURE COMPETITION

Another commendable feature of the Junior Red Cross activities which is of special interest to manual training teachers, is a furniture competition opened on the 12th of February. From Miss Heath we learn that this was open to all members of the Junior Red Cross. The character of the competition very naturally limited it to those who had received instruction in furniture construction and mechanical drawing. Most of the competitors were boys, tho, as will be seen below, one girl was among the prize winners.

The competition was held as a study preliminary to undertaking the actual work of making the furniture for the Red Cross houses. The pieces designed were:

- (a) Demountable reading table 6 ft. by 2 ft. 6 in., that can readily be knocked down for storage.
- (b) Bench similar to table in design, to slip under table. To be 4 ft. 6 in. long.
- (c) Stool of similar design to be used at the ends of the table.

Any school wanting to compete sub-

mitted its designs to the chapter school committee by whom they were forwarded to the National Headquarters.

Appropriate certificates were awarded to the prize winners as follows:

DRAFTSMANSHIP

1st prize, Henry L. Morris, Hume Fogg High School, Nashville, Tennessee.

2nd prize, Carlyle Farahow, Durham City Schools, Durham City, N. C.

3rd prize, Paul Gangewere, High School, Chattanooga, Tennessee.

4th prize, L. G. Bassett, High School, New Haven, Conn.

5th prize, Willis B. Lincoln, Hume Fogg High School, Nashville, Tennessee.



DESIGN BY GEORGE METZ, MT. VERNON, N. Y.

DESIGN

1st prize, George Metz, Industrial Arts School, Mt. Vernon, N. Y.

2nd prize, A. Hyatt Mayer, Princeton, N. J.

3rd prize, Lillian Woods, Industrial Arts School, Mt. Vernon, N. Y.

4th prize, Allan Sheldon, High School, New Rochelle, N. Y.

BOTH DESIGN AND DRAFTSMANSHIP

1st prize, George Metz, Mt. Vernon, N. Y.

MAKING TONGUE DEPRESSORS AND APPLICATORS

The accompanying drawing showing a tongue depressor and an applicator is from a sheet of instructions to teachers sent out by Supervisor William E. Roberts of Cleveland, Ohio. About 12,000 of each of these articles were made in the manual

RED CROSS READING-ROOM OUTFIT OLD-ENGLISH-STYLE.

FOLDING - TABLE 1'-10"



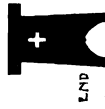
DETAIL of
FOLDING-JOINT
SECTION ON A-B

SCALE - ONE-HALF SIZE

FOLDING BENCH FOR SIDES of TABLE 1'-10"



FRONT



END

FOLDED



OPEN

BOOK-RACK
SEVERAL TO BE PLACED ON TABLE
1'-10"

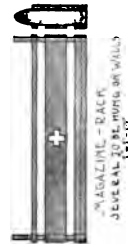
STOCK-FOR ENDS of TABLE 1'-10"



OPEN



FOLDED

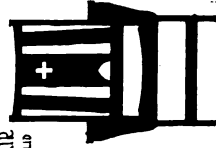


MAGAZINE-RACK
SEVERAL TO BE HUNG ON WALLS
1'-10"

DETAIL of DOWE-TAILED
CLEAT for BENCH LEGS
ONE - HALF-SIZE



SUGGESTED ADA CHAIR
CAN BE BUILT FOLDING or SOLID
1'-10"



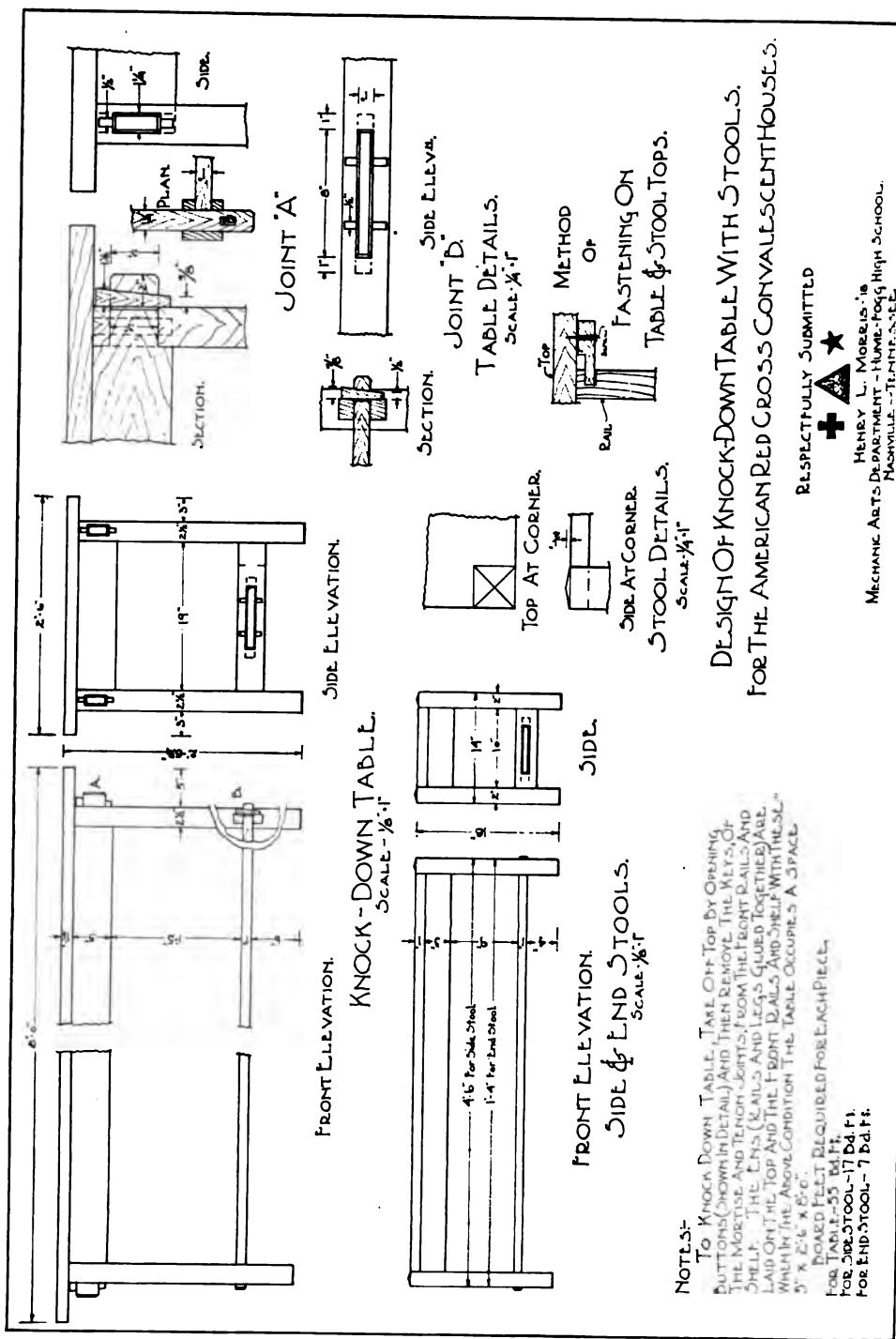
DETAIL of FORGED-JOINT on ENDS
of DRACES
ONE - HALF-SIZE

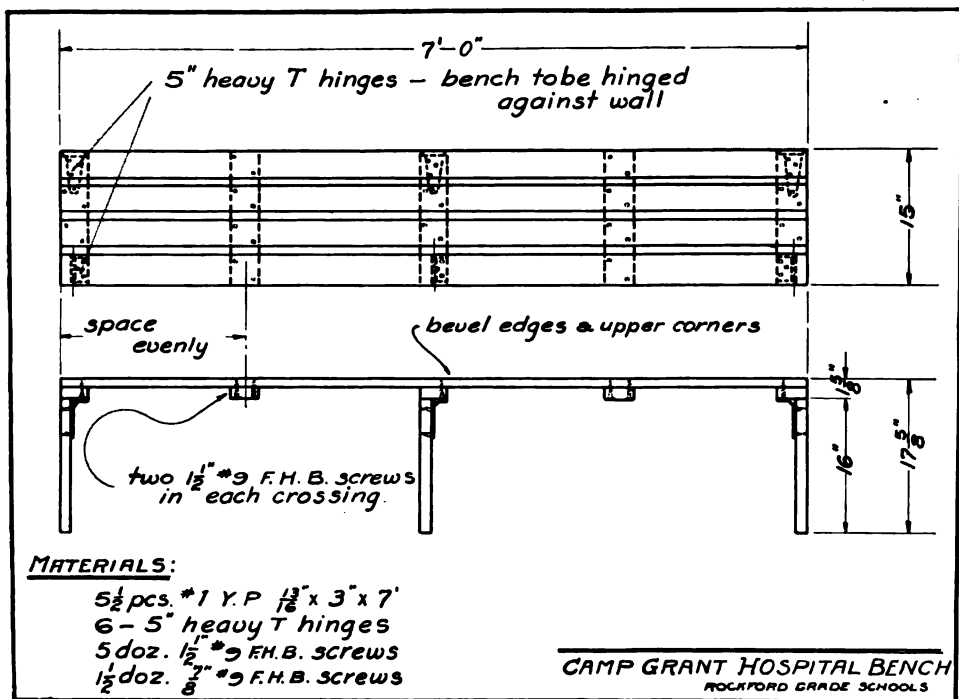


DESIGNED AND SUBMITTED BY GEORGE MELTZ

SCHOOL OF INDUSTRIAL ARTS

MOUNT VERNON, N.Y.





Designed and made for the Camp Grant Hospital, under the supervision of M. D. Jones, Supervisor of Manual Training, Rockford, Ill. Mr. Jones says that any school can serve a real need by constructing from 5 to 50 of these before July 1st. If you are interested, write at once to Mr. Jones.

training knifework classes of Cleveland during one week in April. Material was prepared by sawing strips from a 7/8" board. The instructions sent to teachers were as follows:

The material will be furnished of the right width and thickness:

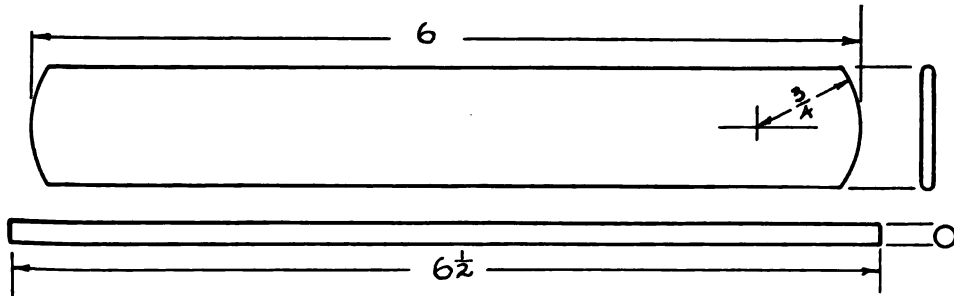
With rule, try-square and pencil, lay off lengths on the strips of wood, and square lines across both sides. If the knife is drawn back and forth several times across the wood on the lines on both sides, it will probably score deep enough so that the wood will easily break in lengths.

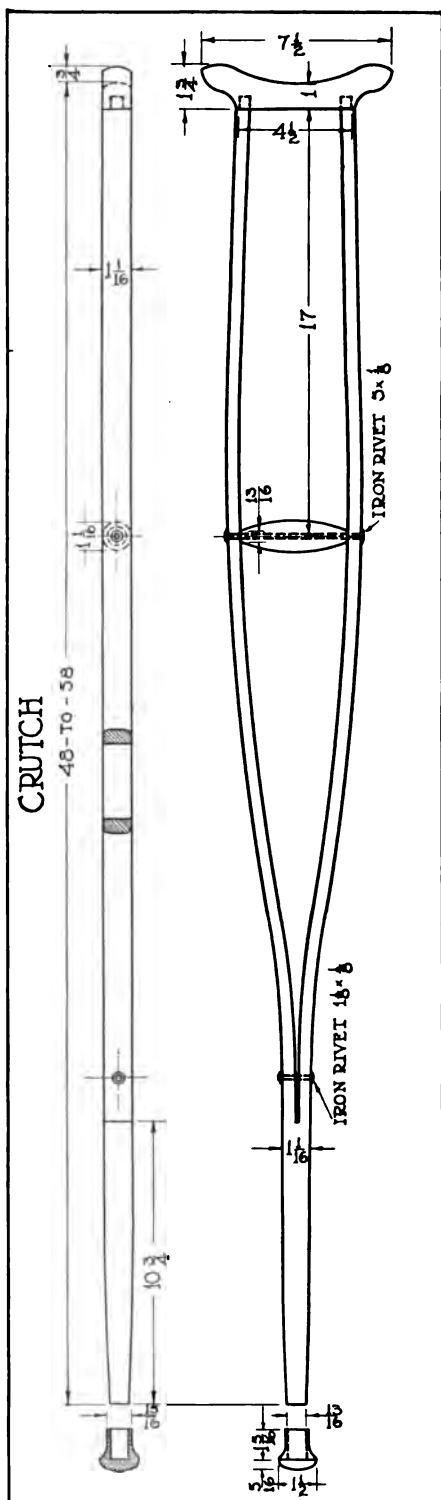
Have six or eight patterns of the depressor drawn and cut from heavy paper or light cardboard and use these patterns for drawing the curved ends of the wood.

Pare the wood to the curved lines, working from the edge toward the center.

It will not be possible to sandpaper off all of the saw marks but the pieces should be sandpapered so that they will be smooth, using the sandpaper blocks for the surfaces.

Slightly round the edges on both sides and ends of the depressor by holding the sandpaper in the fingers. Try to keep the corners sharp and clear at the ends of the curves.





Sandpaper the applicators by holding the sandpaper between the fingers so as to round off the edges. Try to keep the little ends flat.

One of the little squares of sandpaper (20 from one sheet) should sandpaper at least two of the depressors or six or eight of the applicators.

Select one or two of the best boys in the class to act as inspectors to pass judgment on the workmanship and finish of each piece. Try to have a high standard of workmanship. The nature of the finished product suggests that the work should be done with clean hands.

Do not put names or other marks upon the finished pieces. When the pieces are finished, wrap them in a neat bundle, mark the name of the school and the number of pieces of each kind clearly on the outside, and send the package to Room 206, School Headquarters.

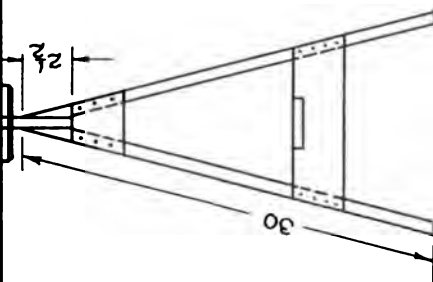
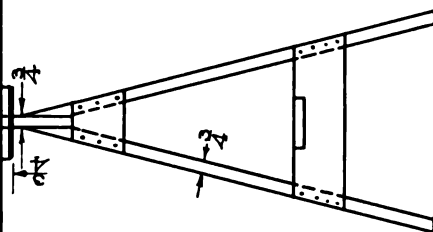
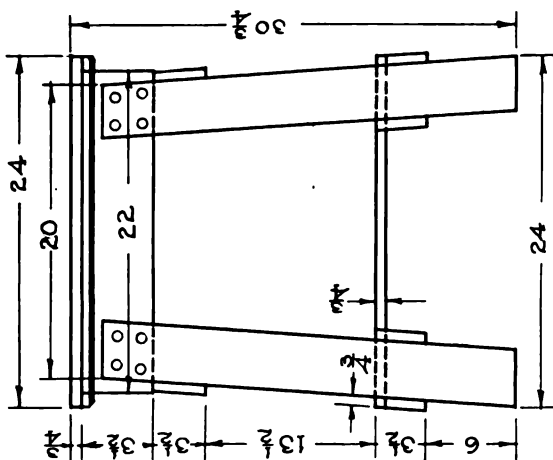
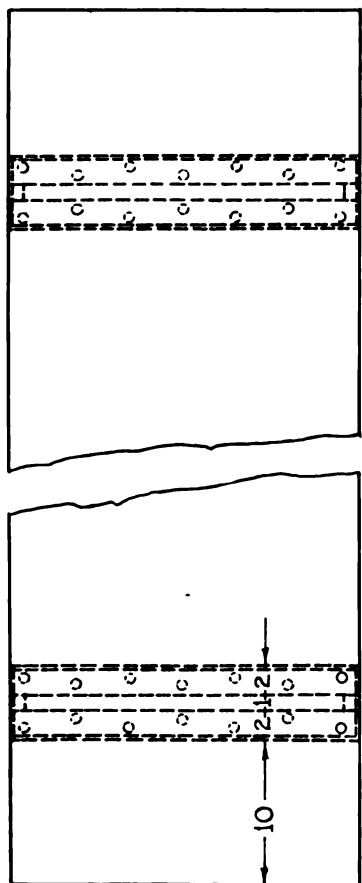
This problem presents opportunity for work on the productive or co-operative plan. If the teacher desires to work on this plan, divide the class into groups of boys, one group to measure and draw lines, another to score and break the pieces, another to lay out the curved ends, another to cut the curves, others to sandpaper, etc. Under this plan boys best fitted for the different types of work can be selected. A little experience will help in adjusting the size of the groups selected for different types of work.

Use all of the material sent to your building.

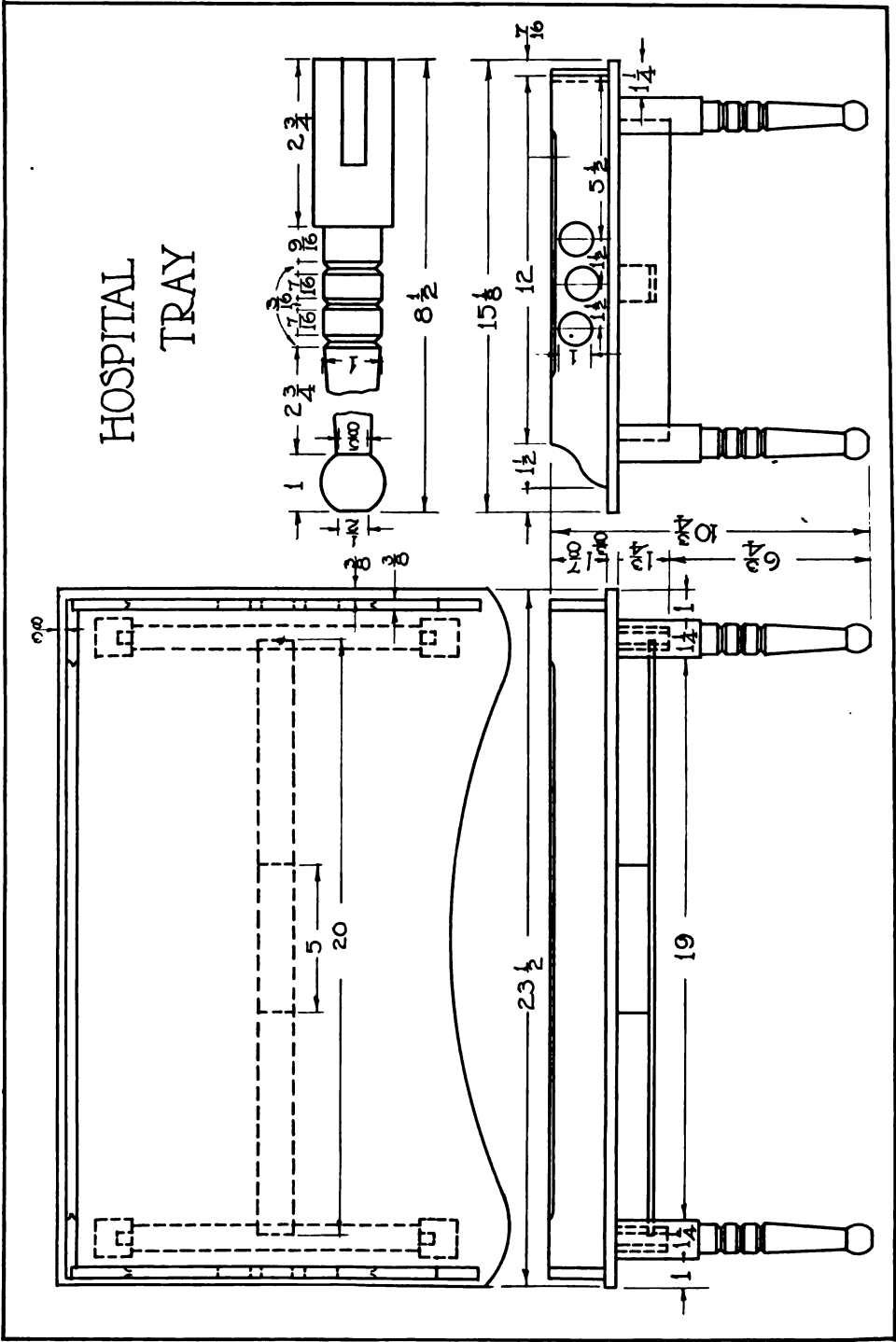
POSSIBLE RED CROSS PROBLEMS

Some excellent pieces of hospital furniture and apparatus have been worked out at the Lane Technical High School, Chicago. Complete working drawings have been prepared and duplicated, but up to the time of sending the last information that came to us, the Red Cross had not found it convenient to order any of these made in quantities. The list includes the following: Crutch (drawing herewith), hospital tray (drawing herewith), mess table (drawing herewith), convalescent chair, company desk, fracture box, bedside folding table, operating table and a Red Cross litter. It is to be hoped that the drawings made at the Lane School will yet be used in furthering the co-operation between the schools and the Red Cross work.

MESS TABLE



HOSPITAL
TRAY



A CALL TO THINK.

CHARLES W. CLARK.

Instructor in Woodworking, North High School, Syracuse, New York.

PERHAPS it is the fact that the war has given us a bent toward serious thinking that occasions this, but still there is every cause for the few thoughts here expressed to occupy the minds of teachers whether in time of war or peace. It is addressed to manual training and industrial teachers especially, because the writer happens to be of that department and for other reasons which will become apparent. If it will imbue any teacher who is on the wrong track with a new sense of the service he is rendering his country, it surely will be worth the expression.

The end of education which accords with the highest ideals is social efficiency in the individual. Industrial education particularly in its high school, vocational and trade school phases, contributes, perhaps, more to the purely economic efficiency of the individual. In the main, teachers of shop subjects are quite prone to leave the moral and cultural aims of education to the teachers of book subjects. Is it wise for any pupil to be able to step out of a class in history or civics or English to a shop where the aim is palpably more material and the atmosphere less ideal?

The departments of manual and vocational training have been obliged during the past few years to draw instructors from the trades. Many have had little pedagogical training, and have brought with them to the school shop the material aims of the factory shop. The writer knows factory-trained instructors with little education who are splendid men of character, men who are unquestionably most fitted to teach America's youth, not only correct mechanical methods but also to instil in them the ideals which make life worth while. On the other hand, he

knows an instructor in a prevocational school who was brought in directly from the trade who brought with him ideals of production only and brought with him as well the common vernacular of the average workman. While visiting this same much-vaunted school the writer heard him chide one pupil with, "That's a hell of a piece of work." It didn't seem that this was quite the correct way to get good results from a backward pupil. It would appear that a vocational aim which permitted the employment of an instructor of that calibre was not the highest. The college-trained teacher who goes to the factory for practical experience frequently has his sense of the ideal jolted by the low standards prevailing in some shops. It is not right to bring any man with those standards to a school shop as instructor until they have been properly modified by a course of training in the true ideals of American education, namely social efficiency. All of this means that the school shops should hold aloft the same ideals that are aimed at in other branches of educational work. Is that not consistent and reasonable?

This must not be taken as a diatribe against the practical shop trained teacher. The writer has already expressed his strong commendation of many of them. As a matter of fact there are many men who slide thru the more ideal training of the colleges who are no more qualified to teach America's boys than the low-standard man from the industry. Rather is this a call to all of us who have the supreme privilege of training the boys who will be the men of America after the war, to re-enthuse ourselves with a feeling of the nobility of our calling. There has been

entrusted to us a magnificent responsibility. Teaching is eminently altruistic, there is no place in the profession for selfishness; its one outstanding quality is service. This presupposes a high idealism. The boys who come under our guidance as shop teachers probably will enter industrial vocations rather than the professional. Notwithstanding, they are as much entitled to teaching which instils ideals of manliness, nobility of character, appreciation of good, and a fighting spirit

toward evil, as are those being educated along the more cultural and college preparatory courses.

We are engaged in a great war for democracy, aiming for the triumph of right. Many of us are taking our places in the front ranks. Those of us who remain have a great responsibility. May it be said that we are doing our bit in training for social efficiency in all its phases—mental, moral, economic—the future citizens of this great nation.

STIMULATING INTEREST IN THE SHOP.

M. NORCROSS STRATTON,

Instructor in Practical Arts Department, State Normal School, Fitchburg, Massachusetts.

EVERY boy likes to play conductor. Boys like to play anyway, and if our formal shops and schoolrooms can be made more attractive by putting in more play, let's do it. Well do I remember when I was a boy of having the job assigned to me of putting in several tons of coal each winter. They used to dump the coal in the alley out in Denver, and it had to be carried to the basement coal bin, the usual method being via the wheelbarrow. I enlisted several boys, and together we built a sort of railway which worked by gravity. A small car equipped with wheels from an old wagon ran down the inclined runway which we constructed of old lumber collected from everywhere. When the car reached the end of the track it hit a bumper which caused it to dump the coal into the basement window. It did not take long to put that coal in and we put several tons in for neighbors at a profit. Work, play and education all at the same time.

Well, as I said, "Boys like to play conductor"—I provided my tool-room boy in the practical arts shop in Springfield with a ticket punch and myself with some little hardware orders with printed items upon them, such as nails, screws, brads, etc.

When the boys wanted nails or screws I simply wrote the amount needed on the slip and the tool boy filled the order.

Sometimes he counted the material out and sometimes he weighed it on the scales provided. He punched the ticket which made it void and filed it in its proper place. The ticket punch and the system kept him interested in his job in the tool and supply crib. The scheme also prevented much waste of small hardware. We used a system of brass checks for obtaining tools as they do in real shops.

Boys like to have all the scenery when they play. I put my shop clerk behind bars—a regular miniature office in one corner of the room with barred windows labeled clerk, cashier, etc. The boys liked to be shop clerk. I also had a telegraph running between the clerk's "office" in the carpentry shop and the clerk's office in the printing shop. They sent very important messages over this wire I can assure you, but they used to stay after school to practice on it until we literally drove them out. By the way, I think the shop clerk idea is a valuable one; it helps the teacher in many ways, and is almost necessary in "putting over" related work.

The clerk enters the data from the time-

cards, which all the boys keep, onto the work sheets, totals up the work sheets and carries the results or the total time on each operation to the classroom. He stamps the date on the time cards with a rubber stamp and checks them up after the day's work is done.

His duties also include signing for and checking up material delivered to the department, making out orders, keeping attendance, and, when visitors come, he courteously requests their signature in our visitors' book, and escorts the visitors through our "works."

The shop store, another innovation, is fitted up with counters, change drawers, string and paper for tying bundles, and the store clerk is provided with an apron, a desk and a duplicate sales book. He soon learned to manipulate carbon paper like an expert when making real sales of real articles to our real customers—the boys and girls of the school. Fine training though and fun! A cash carrier to the cashier's office added another "feature."

We sent all material made in the shops to the store. Articles like sleds, swings, go-cycles, bicycle carriers, garden tools, taborets, settees, etc., are sold, and things made for the school plant are delivered via the store clerk who keeps in his books a careful record of all transactions and all stock on hand.

My private secretary! Oh, my yes. I had a private secretary too—had a desk in my office upon which he had a typewriter, and in the corner of the room were letter

files, made by the boys, pencil sharpener, and other office necessities for his use. The boys used to write letters of application for the position of secretary, shop clerk and store clerk, and my mail box was flooded. And speaking of mail, each boy in my department had a little mail box in the corner of the room.

I often put personal letters in these boxes, commending or otherwise the boys for their work or conduct—not too often, but just often enough to keep them interested. Along about report-card time the boxes were pretty well filled with these personal letters. It takes some time out of hours, but ask some of the mothers if it pays. I still get letters from some of those little friends of mine who have left school.

When we put thru projects on the factory plan we had little signs indicating the departments—sawing, planing, assembling, etc. This helped make the shop more real and was another "play" feature which made our practical arts shop attractive.

The time cards, the individual filing boards in the printing shop, the "dummy" pay checks, are some of the other features the boys and I worked and played with during our shop periods.

With such devices discipline in the shop is maintained with little or no effort; there is no discipline problem. Every boy of the class is so busy and so interested in our "works" that the superintendent—the teacher—is kept on the jump keeping up with the workmen.

Industrial Education is one of the essential things needed to offset the monotony and specialization of modern industry, and to enable workmen to find and keep their jobs.

—JOHN R. COMMONS.

TEACHING THE USE OF SCREWS

DE WITT HUNT,

Director of Shop Practice, Agricultural and Mechanical College, Stillwater, Oklahoma.

ANY course in woodwork contains, in some part, a group of models in which screws are used as the fastening element. When the student comes to the problem of the size of screw to use and the size of drills to use, he is entirely unable to decide for himself. Too often the drawing of the project has a note like this, "Use 2" No. 10 R. H. Brass Screws." The student should be given enough information in note form to enable him (a) to

This is, of course, general information to the student. The rules which give him definite directions for the selection of size of screws and drills are given at the last of the talk and are as follows:

(1). When the screw thread enters edge grain, when fastening two boards together, the screw should be twice as long as the piece thru which it goes is thick.

(2). When the screw thread enters end grain, the screw should be three times as

No. of Screw.....	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14
Decimal Equivalent.....	0.124	0.137	0.150	0.163	0.176	0.189	0.203	0.216	0.229	0.242
Loose Fit.....	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{5}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$
Decimal Equivalent.....	0.125	0.140	0.156	0.171	0.187	0.187	0.203	0.218	0.234	0.250
Pilot Hole.....	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{3}{8}$ or $\frac{7}{16}$	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{1}{8}$		$\frac{5}{8}$		$\frac{5}{8}$ or $\frac{1}{2}$

NOTE—We only keep screws of the following sizes in stock: No. 5, No. 7, No. 10, No. 12, and No. 14. The following drills are in stock: $\frac{3}{16}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{1}{4}$ -inch. For Pilot Hole for No. 5 screws, drive a small nail.

choose the length of screw, (b) to select the screw of proper diameter, and (c) to call for drills of the proper size for boring holes for the same. The writer has developed two rules and a table which are given the student as notes in a lecture which precedes the use of screws. The first part of the talk is concerning the different types of screws, the shapes of heads, different metals, etc., and it states that five things are needed to definitely indicate the kind of screw needed for any particular place:

1. The number wanted; example: 1 gross.
2. The length; example: 2".
3. The number, indicating diameter; example: No. 10.
4. The kind of head; example: round head.
5. The metal; example: brass.

long as the board thru which it goes is thick.

(3). When length of screw is determined, select screw of proper shape and length from screw cabinet. Note the number indicating the diameter, then use this table for determining the sizes of drills to use.

The advantage of this method of presenting the subject of fastening with screws is easily apparent. The rules for finding the length of screws will not always be correct, but in ordinary work they will save the instructor many unnecessary questions. There are many cases where these rules will not select for the student the best length of screw, but they do two things for him: (a) Cause him to reason for himself thru given limitations to a correct conclusion; (b) enliven his powers of selective ability by forcing him to

determine for himself the limitations of his problems.

The third rule might not be accepted by all teachers, but the student who is sent to the screw cabinet for a screw 2" long is necessarily limited to the screws contained in the cabinet. In the writer's shop all 2" screws are No. 10, and generally each length is kept in only one diameter.

The writer for several years has carried the drills in a small drill box in his apron pocket, not to keep drills from being broken without his knowledge or to keep them from being stolen, but to require students to allow a checking of the work just before the holes are drilled. Many

times a pupil has been saved a spoiled piece, because in this way improperly located holes are not bored; and also the student is checked up on his conclusions as to size of drills. How many teachers comply with the request: "Mr., let me have two drills for these screws." Students soon learn to ask the writer definitely for two sizes of drills, giving the size as they ask.

The writer has thought of having a blueprint of these rules and this table to frame and put on the wall near the screw cabinet, but he fears that this would cause students to neglect looking to their notes for information.

HOW I STARTED MY GRAMMAR GRADE BOYS THIS YEAR

FIFTH ARTICLE

ASIDE from the grade and time of the year specified, there are other conditions which modify the method of presenting the first lesson in woodworking. Therefore, I wish to state that this particular seventh grade class was one in which most of the boys had had at least one year of manual training, that a few had never worked in wood, and that I was a stranger to the class as a whole.

My experience has been, that a three-months' vacation for a healthy boy usually promotes a condition of hilarity that does not subside at the first sight of a manual training shop. I always try to assume an attitude that will suggest to the class that manual training is such an extremely serious thing with me that any act not intended to contribute to the betterment of this particular exercise will be regarded as a most serious offense. There is time for the "good fellow" spirit to come later.

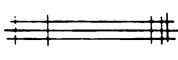
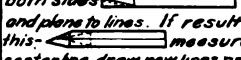
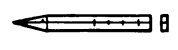
Pupils were assigned benches, monitors were appointed, and the class roll taken as quickly as possible. As soon as com-

plete, I asked the boys to answer roll call by standing erect with arms folded as their names were called instead of answering "present." By this method I secured their undivided attention without asking for it in so many words.



*GARDEN STAKE
Beginning 7th Grade*

In as few words as possible I announced that our first exercise would be a garden stake, a sample of which I exhibited explaining its use and telling how incomplete any garden would be without garden stakes. In other words I created in

Class Exercise <i>GARDEN STAKE</i> Seventh Grade				
	DRAWING	DEMONSTRATION	DIRECTIONS	TOOLS
Lesson I	None	1 Sharpening plane 2 Planing level 3 Gauging 4 Planing to gauge line	(1) Distribute stock cut $\frac{1}{2} \times 2\frac{3}{4} \times 17$ " (2) Plane working face level and submit for inspection. If satisfactory mark it. (3) Plane joint edge square with working face and submit for inspection. (4) Gauge as wide as possible and plane opposite edge to gauge lines. (5) Inspection. If below line gauge second line and try it again. (6) Same process as No. 5 for thickness. No dimensions given.	Vise Jackplane Trysquare Marking gauge
Lesson II	 Letter name and title.	1 Saws - their differences and uses. 2 Rough sawing 3 Planing with and against grain 4 Measuring with rule	(1) Draw pencil line lengthwise through center on both sides. (2) Draw pencil line around stock 4" from end and connect with center line on both sides. (3) Saw on dotted lines and plane to lines. If result is somewhat like this:  measure back 4" from end of center line, draw new lines as shown and plane again.	Crosscut saw Steel square Rule
Lesson III	 Show no dimensions Scale $\frac{1}{4}'' = 1''$	1 Backsawing to knife line 2 Laying off for boring 3 Back-boring	(1) Make knife line around about $\frac{1}{4}$ " from opposite end and saw to line. Do not plane end. (2) Measuring on center line make 4 cross lines 2" apart beginning $\frac{1}{2}$ " from squared end. (3) Bore $\frac{1}{2}$ " holes at each intersection of center line and cross lines	Knife Bench hook Backsaw Brace Auger Bit
Lesson IV	Begin drawing for next exercise	1 Sandpapering 2 Applying finish Reason for using oil.	(1) Sandpaper and submit for inspection. (2) Finish with boiled linseed oil. Allow boys who finish first to saw stock for next exercise as a special reward for their dexterity.	Sandpaper Sandpaper block

the minds of the boys a feeling of need for this particular thing before they started to work.

I had a very definite reason for starting with this particular project: it served the double purpose of a practice exercise and an examination. It is so simple that every boy could be expected to finish it in a short time and it is elastic enough so that several errors may be made and corrected without in any way detracting from its appearance or value as a garden stake.

All stock was cut to the same size, clear cypress being used, because of its decay-resisting properties. I explained that, while a garden stake $1\frac{1}{2}$ " wide might work just as well as one $2\frac{1}{2}$ " wide, I would give the highest grade to the boy who finished his stake the best, and at the same time had the greatest dimensions as to length, breadth and thickness. There

was no lack of interest at any time.

No dimensions were given except for boring the holes and tapering the end. My method of procedure is shown by the accompanying outline.

—PRESCOTT W. EAMES.

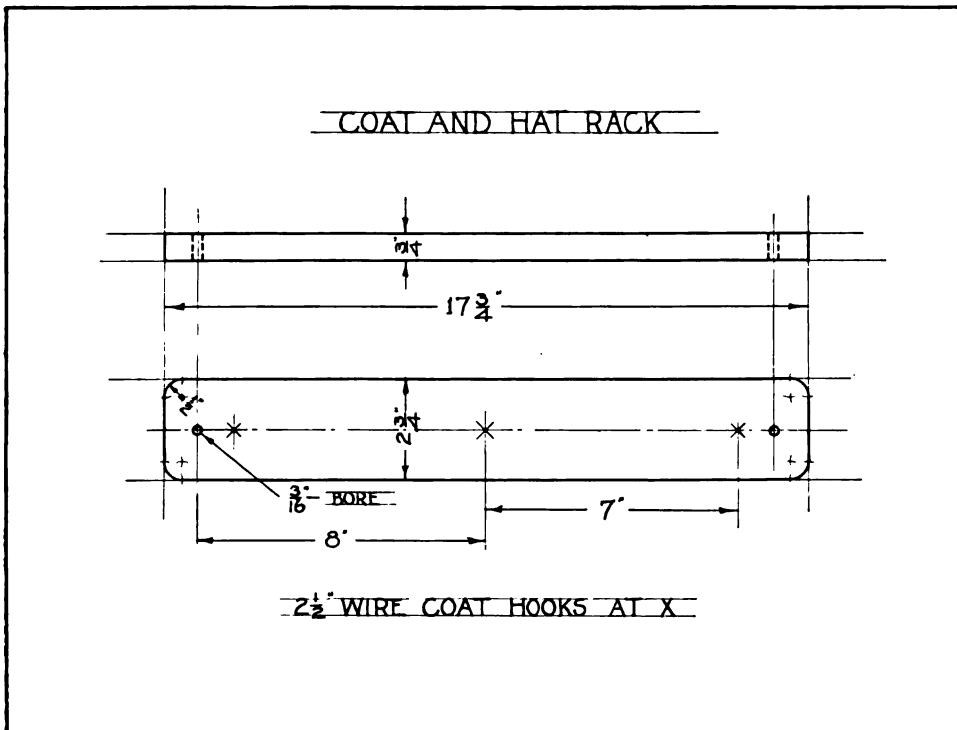
Kansas City, Mo.

AFTER the pupils of my 7 B class are assigned to their respective benches we have an introductory talk on the purposes and aims of manual training.

The jack-plane is then described and its use demonstrated.

Stock for a small model, such as a key-board, coat-and-hat-rack, or any other small piece that requires planing to definite dimensions, is distributed.

The planes being previously adjusted, the pupils are directed to plane the better



of the two broad surfaces, so as to get it smooth and straight. They are now shown how to test the accuracy of their planing by the use of the eye and try-square. This work is also tested by the teacher and marked with a face mark. This surface when finished is called the face side.

One edge is now planed square with the face side, making use of the eye and try-square to test the result. This edge is called the face edge, and is also tested by the teacher who then puts on the face mark, if correctly planed.

The marking-gage is now introduced, described and its use explained. The pupils gage the required width and plane to line, being careful to get the second edge square with the face side. This is also tested by the teacher.

They now get the required thickness by gaging from the face side. Both edges

are to be gaged to show how much is to be planed from the second side.

The block-plane is now described and its use demonstrated. No bench-hooks being used, they are instructed to block-plane one end of their piece square.

The proper use of the rule is explained. They measure the required length and square a knife line around the piece. At this time the back-saw is introduced, and the method of using it is illustrated. They saw their pieces close to knife-line, and block-plane the end smooth and square.

This completes the method of getting any piece to a required size, and the pupils are soon led to see the importance of knowing how to square up a piece of stock accurately.

The directions for planing are now written on the blackboard for the use of the pupils until such time as they become familiar with the process.

From a drawing on the blackboard, the class is shown how to lay out their piece for the making of a coat-and-hat-rack. They are shown how to use the compass to draw the curves and how to round the corners by means of the chisel as used in vertical paring.

—D. P. HARRIGAN,
Summer School,
Minneapolis, Minn.

I THINK the boy in the seventh grade can be taught the proper way to use tools and do skillful, careful, accurate, and neat work better than at any other time in his public school career. The foundation can be well built here.

The first lesson I give the seventh grade boys is the most interesting to me as well as to them. I have the class arranged in front of my demonstration bench. I tell them the great possibilities of a piece of wood, and show them the kind of material I am about to work on. I handle the piece of stock as though it were something good to eat, picking it up and laying it down with extreme care. I talk to them as I work, commenting on the use of the tools

and the smooth effect of the sharp tool on the wood. As I test the work during the steps of squaring up the stock, I work very carefully and look at the work many times. When the piece of stock is squared I pass it around the class and say, "Be very careful you do not drop the work, boys." I next ask several questions about the use of the rule and try-square, which teach them to have a great deal of respect for a sixty-fourth of an inch. I give them the steps of squaring-up stock on a slip of paper, and tell them to always follow these instructions, unless they have some very good reason for doing it some other way. I then give them each a piece of stock, trying to give them the impression that they have something of great value.

Each lesson, I talk to them and try to teach them to think for themselves and do neat, careful and accurate work. If the child is taught this from the first lesson, and the teacher follows it up through future lessons, I think the boy is on the road to success in this branch of his school work. —WESTON W. MITCHELL,

Bryant School,
Minneapolis, Minn.

APPRENTICESHIP SCHOOLS IN THE UNITED STATES.

J. B. DENNIS,

Instructor in Shopwork, Detroit, Michigan.

THE origin of the apprenticeship system seems to be in doubt. The earliest known application of it was made in England in the thirteenth century. Some writers claim that previous to this the monks on the continent of Europe taught the boys, in the vicinity of the monasteries, the rudiments of the handiwork that they themselves practiced.

The Craft Guilds in England developed the good points of this system so that in the fifteenth and early part of the sixteenth centuries they practically controlled

the number of apprentices in each craft. Among the good points developed was the power to get certain laws enacted to govern the treatment of the apprentice by the master, and to provide for the examination of the apprentice at the end of his apprenticeship term to determine if he had been properly instructed.

The customary length of the apprenticeship term was seven years. The standard was very high, and was maintained by giving special inducements to the sons of masters, and by charging a very high fee

to those entering the trade from the outside. This made the craft almost exclusive, and in some respects was beneficial, as the skill of the father was handed down to son from generation to generation.

With the establishment of the colonies in America it was to be expected that the customs of the mother country would be our industrial heritage. The period up to the Revolutionary War was marked by little progress along industrial lines. Not only were the industries limited by the lack of tools, but the English King had forbidden the manufacture of any article which was made in the mother country. Little was done during this period along the line of training apprentices in any trade.

The period following the war brought about changes in rapid succession. Now that the colonists could manufacture anything they wished small shops and factories sprang up as rapidly as the demand for their goods would warrant. The training of the apprentice during this period assumed almost national importance. Nearly all of the states made laws regulating the treatment of the apprentice by the master. The length of the apprenticeship term in most trades was four years.

The Civil War was responsible for the rapid growth of the industries between the years 1860 and 1870. With the advent of this war the factories and shops were crowded to the utmost to provide cannons, rifles, ammunition, and small arms for the soldiers in the field, as well as to provide the machines necessary to manufacture other articles. Many of the best mechanics went to war on the first call, and manufacturers were forced to fill their places with any one they could find. The situation at this time was similar to that of England and France in 1915-16.

DEMAND FOR MACHINE OPERATIVES.

At the close of the war labor-saving machinery began to be used extensively. The manufacturer soon discovered that a boy could be trained in a short time in the operation of a machine so that work could be turned out with rapidity. It was no longer necessary to employ a skilled mechanic to run a machine. The skilled mechanic was too valuable a man, he was needed to plan, build, and organize factories.

Later the supply of skilled mechanics began to disappear, and the mechanic who "picked up the trade" began to put in his appearance. Then the manufacturers began to realize that they had not been developing brains as rapidly as they had been building factories and designing new machines.

It was during this period that educators and parents were lamenting the fact that boys were no longer taught trades. It is said that an anxious mother asked Rev. Lyman Beecher "How can my boy be taught a trade?" and he replied: "Have him smash a jeweler's window and steal a fifty dollar watch, and he will be sentenced to the Elmira Reformatory, the only place in the state of New York where he can be taught a trade."

At present there are more than 300,000 industrial establishments in this country. Each shop has its own peculiar need for skilled and semi-skilled workers. Very few of the employers are giving much time and attention to the training of their workers. Each is depending upon chance to pick up workmen as needed.

A number of reports have been made during the past five years, and all agree that the problem of educating the nation's workers is a serious one. When we realize that 100,000,000 young people are required yearly to enter the ranks of the

wage-earners the difficulty of the situation is apparent.

The Congressional Commission of 1914, appointed to consider the problem of industrial education, reported that hardly one per cent of the 14,250,000 persons now engaged in mechanical and industrial pursuits have had or now have any chance to get adequate training.

SUPERIORITY OF THE SKILLED MECHANIC.

Farsighted manufacturers have for the past twenty years given a great deal of time and attention to reducing the cost of production. Numerous experiments have been made to determine just where there is preventable waste and just how to remedy it. After careful and repeated tests with skilled and semi-skilled workmen working on the same product it was found that the skilled workman excels in four respects:

- (1). Less time is required to complete the same piece of work.
- (2). The proportion of defective parts produced is decreased.
- (3). The cost of machine repairs is greatly diminished.
- (4). Because of the increased intelligence of the workman the cost of supervision is greatly lessened.

As a result of these tests some of the leading manufacturers decided to open schools in their shops for the adequate training of their apprentices. About twenty of the leading manufacturers of this country opened schools. Perhaps the best known of these pioneers are the General Electric Co., of Schenectady, N. Y., the Brown & Sharpe Mfg. Co., of Providence, R. I., and R. Hoe and Co., New York, N. Y.

The length of the apprenticeship term in these shops is four years. The boy to gain admission as an apprentice must be

at least 16 years old, physically sound, not addicted to the use of cigarettes, and must have had at least a grammar school education. If the boy has completed a full high school course his term of apprenticeship is reduced from six months to one year.

Before the boy is permitted to sign articles of apprenticeship he is given a three-months' trial. The foreman of the department in which he works makes a careful report each month regarding his progress and behavior. If he proves satisfactory at the end of this period he is accepted as a machinist's apprentice. The object of this trial is to determine if the boy is in earnest, and to ascertain if he has a natural aptitude for the work.

Two hours is spent each week in the schoolroom during the first two years, and four hours per week during the next two years. No deduction from wages is made for the time spent in school. The work of the school is planned to facilitate the work of the shop. When a problem arises in the shop it is taken up and solved in the schoolroom. In this way the boy's mind is not taxed with rules and formulas that he has not had the opportunity to apply. As may be expected, the most prominent place in the course is given to shop mathematics. Drawing is taught not so much to make draftsmen, as to teach the apprentice to read blueprints intelligently, and to design jigs and fixtures. Special effort is made to get the boy to realize the importance of his trade, and to have him feel that it is just as honorable as the profession of the lawyer or that of the doctor.

The work of the boys in the shop is under the supervision of the superintendent of the school. The boys are free to ask him or his assistants any questions regarding their work. The apprentice passes from machine to machine as rapidly as his ability will permit. This has a twofold

object, teaching him the routine of the shop, and also giving him an opportunity to select that part of the shop best suited to his taste.

While the wages differ slightly in some of the shops, the average wage is 14, 15, 17, and 18 cents per hour during the four years. In some establishments the apprentice receives a bonus of \$100 from the company at the completion of the course.

The supervision of the boy does not end with the shop, but after shop hours he is looked after to see that no bad habits are

formed and that he does not associate with questionable companions.

The apprenticeship school stands for the development of the boy along the line of his natural ability. There is no desire to train boys who are better fitted by nature to do some other kind of work.

Never before since the apprenticeship system was founded has the boy entering a trade had the opportunity of learning his trade so thoroughly, and at the same time earning a living wage, as at present in the modern apprenticeship school.

THE NEW HAVEN CONVENTION OF THE EASTERN ARTS ASSOCIATION

GEORGE M. MORRIS,

Assistant Director of Manual Arts, Boston, Massachusetts.

THE last annual meeting of the Eastern Arts Association was the most successful in the history of the organization. The program was almost wholly confined to the relation of school work to the war. The speakers described successful school work now in progress or gave constructive suggestions as to ways of making the work of schools meet the needs of the present and prepare for the future.

At the opening session addresses of welcome were delivered by the chairman of the city council, President Hadley of Yale, and by Superintendent of Schools, F. H. Beede. President Hadley spoke highly of the value of art as a part of the national and religious life, and its importance at this time. Superintendent Beede spoke of the educational features of New Haven, such as the high school with four thousand pupils, Boardman apprentice shops, open-air schools, and special classes for defective children. In New Haven there are about twenty-seven thousand school children, of whom about one-third are American, one-third Italian, and one-third other nationalities. Mr. Beede characterized the schools

of today as too academic, and expressed the opinion that the work of the schools should be connected with the after-school life of the pupils.

The importance of retaining the continuity of the instruction in the schools in spite of the war was emphasized by F. W. Wright, deputy commissioner of education for Massachusetts. Mr. Wright referred to the mistake of England in closing her schools and plead for "unusual schools" to meet the present needs of the country, yet with the instruction so based on fundamentals that preparation for after the war shall not be neglected. Mr. Wright spoke of the present as offering the greatest opportunity of all time for implanting in the children's mind the sense of loyalty and the sense of service.

James Frederick Hopkins, director of art education, State of Massachusetts, illustrated the distinction between earning a living and living a life. The problem of citizenship is one of developing appreciation of ideals as related to standards of living. Mr. Hopkins considered some important aims in art teaching, such as

the development of power: (1) To make representative sketches which state facts; (2) To make and read plans; (3) To furnish a house tastily with well-chosen furniture, hangings, and pictures; (4) To arrange flowers effectively; (5) To plan architectural re-arrangements; and (6) To dress in good taste. He also considered the study of the community conditions, that the school can better relate its art teaching to the local needs as very necessary to successful work, and made a plea for more time in the school curriculum for art instruction.

The exhibit of war lithographic posters by Joseph Pennell was of special interest, owing to the address by the artist, himself. Mr. Pennell told of his visits to munition plants in England and of his impressions on the battle-front. His experiences made him feel strongly that America offers today plenty of opportunity for artists. At the front there was little to inspire; but as one came away from the scenes of battle, the action of the forces of war became more and more interesting. The industrial life of a country at war offers exceptional material for artists. Mr. Pennell was harsh in his criticism of the posters of the first Liberty Loan, which in too many cases were produced for the money they would bring. He is hopeful of the future with government support in recognition of the service good artists can willingly render to the cause. America was not prepared to meet the needs of the time, as few artists understood the principles of lithographic production. Mr. Pennell deplored the absence in this country of any school where a man can learn lithographing. With the aid of committees and the co-operation of artists and governmental officials, better results should be expected in the future.

The subject "Conservation of the Individual in Art" was handled by C. Howard

Walker of Boston, who spoke of the necessity of technique in art and described individualism as carried to the extreme by many art teachers of today. Self-expression on the part of adolescence is generally far from artistic, and should not be admired because of its individualism. As against the faddish appeal to the imagination of the pupil, Mr. Walker would insist on accuracy of representation as the first requisite of art teaching. Pupils should learn to draw what they see before what they imagine. If the pupil has capacity for artistic expression, it cannot be suppressed. "A work of art is the incontestable thing, wherever you find it."

Mrs. Honore Willsie, editor of the *Delineator*, gave an interesting account of the work involved in getting a story illustrated and edited, and explained the relations between the author, the art editor, and the magazine editor. She told of her ambitions for the *Delineator*, in which by a series of articles she hoped to define the spirit of Americanism. She dwelt at some length on her hope that the spirit of America may sometime be expressed in art. Her word pictures of the many phases of American life, from the rolling plains to the great engineering enterprises, each expressive of the spirit of the country, were very strong. The artist who first pictures on canvas the story of American freedom will make a valuable contribution to the American cause at this time. It is Mrs. Willsie's hope that such a picture may soon be painted.

The Friday morning session of the Manual Arts section was not according to the announced program, owing to the necessary absence of the chairman, John C. Brodhead, and two of the speakers. The subject, "Elementary Manual Training in War Times," was however discussed from the standpoint of the lower grades, of the upper grades, and of the relations of the

schools to the Junior Red Cross. Florence O. Bean, assistant in manual arts, Boston, illustrated her talk with specimens of fourth and fifth grade work in which the processes of elementary bookbinding were applied to the making of checkerboards, domino cases, puzzles, etc. Thousands of these objects have been sent thru the Red Cross to the soldiers in France, and in return many letters of appreciation have been received from the men in the trenches.

Mrs. Percy Talbot Warden, chairman of the New Haven Junior Red Cross League, spoke on the local conditions and the value of enrolling the children in the Red Cross activities.

The discussion of the war work of the upper grades took the form of a round table, in which E. A. Reuther, of New Jersey, sounded a note of caution in advising care in the choice of work given children to do. We should make sure the results are needed and that the cost of production is within reason. Mr. Reuther made some very constructive suggestions in the matter of organizing the sewing work. He illustrated how a problem of production should be analyzed and made to yield material results and valuable training of the child.

Dr. Ernest Kent, of Jersey City, gave an account of the successful making of fireless cookers in the upper grades. This problem involves work in sheet-iron and soldering as well as in wood, and as a fuel saver it is a good war problem.

Arthur F. Hopper, of Plainfield, New Jersey, showed an effective method of correlating the different activities of the school with the Red Cross organization. Mr. Hopper expressed the need of guidance from the central Red Cross authorities in the work to be done, in order that waste of material and labor may be avoided. Frederick P. Reagle, New Jersey, explained the card system used in his

city in handling the orders for Red Cross and other war activities. He also referred to the woodworking problem of making fruit and vegetable evaporators as one particularly appropriate at this time, owing to the scarcity of glass jars and the necessity of food conservation.

Thru the initiative of Mr. Reagle and Mr. Ward at this meeting the following motion was passed by the Association at its business meeting:

"That owing to the desire of teachers of handwork in schools to be of assistance to the Red Cross, it is moved that a committee of three be appointed by the president to secure thru the proper authorities definite information and instruction relative to articles needed by the Red Cross, which can be made by pupils in schools, particularly by boys in the upper elementary grades."

At the afternoon session of the Manual Arts section the subject "Advanced Shopwork in War Time" was considered. Edward C. Emerson, acting associate director of manual arts, Boston, spoke on the work of the Boston prevocational schools, and exhibited examples of printing, Red Cross boxes, checkers punched from junk board by specially made machinery, etc. Mr. Emerson showed drawings of approved furniture, hospital devices, and camp articles, many of which are now being made in the schools. He also outlined the work of the Massachusetts War Committee, of which he is chairman, in securing and filling orders for Red Cross, Y. M. C. A., camp, cantonment, and hospital needs. In Frank E. Mathewson's absence, Hugo Froehlich, of Newark, New Jersey, on short notice, gave an account of the correlation of art work and manual training in his city in making toys and decorating common objects to be sold. In this manner \$4,500 were raised by the schools for relief work. The decoration of the objects dis-

played showed interesting application of simple units of design. Albert E. Dodd spoke on the work of the Retail Merchants Research Association, as related to the teachers' problems. He gave interesting examples of prominent business men, such as Henry Ford, in recognizing the economic forces as an important element in the efficiency of the workmen. As social workers to analyze the individual economic problems, employers have found teachers particularly well qualified. Mr. Dodd referred to the general growth of the idea of national service. He also emphasized the need of a Department of Education at Washington, headed by a Secretary of Education.

The following account of the Art section meetings is quoted from Helen E. Cleaves, of Boston:

At the Friday morning session posters were discussed: their history, their power, and their production, by artisan lithographers. Attention was called to the fact that in this war the poster was doing more than the work of Paul Revere, not only reaching every citizen, but also staying with him to keep the story in mind. It was shown by the practical lithographers that almost any conceivable effect produced by the artist could be reproduced by the modern processes of color printing. Hence, the artist might feel free to conceive ideas and express them in color. The lithographer could do the rest.

Joseph Pennell stayed over from the preceding day to make a special appeal for more thoro technical training for artists, so that the artist could be the lithographer, and never turn over his work to an artisan.

The afternoon was devoted to serious discussion of two purposes of art, the enrichment of industry and of leisure time. Frank Stephens, artist and author, made it clear that industry and art need such materials as wood, stone, metal, wool, and cotton, all of which come from the soil. Taxation of land values as a means of freeing the land which is now held for speculation, was explained and urged as a remedy for needless poverty in the midst of plenty. The connection between art and economics was made clear, and the study of economics was urged upon art educators, as a

means of making their work effective.

The necessity for free time, in order to practice any of the arts, was emphasized by Colonel H. Dwyer, of Providence, Rhode Island, who told of his travels as a painter. The need of art to make leisure time safe in a democracy was also made clear.

Other meetings of importance and interest were those of the Household Arts and the School Garden sections. Experts in these branches discussed marketing, preservation of foods, war foods and their cookery, Red Cross sewing, war time dressmaking, effects of the war on the textile markets and its influence on courses of sewing, canning, organization of school gardens, etc.

The luncheon meetings were made significant by the many fine talks that were given. While these luncheons were planned for special groups, such as the college and normal school graduates, the New Jersey members, the Teachers College Alumni, the Massachusetts Normal and Pratt Institute Alumni, they were in no way exclusive affairs. Thruout the whole convention, there was displayed a fine democratic fellowship.

At the Inter-Club Luncheon, Arthur D. Dean, in speaking on the "Universal Training for National Service," referred to the pressure of the times, making us all feel we must in some way get into war work. He predicted a great change in manual training, that, because of the influences now at work, it would never again be carried on as before the war. At present, manual training seems inadequate and flat in face of the one big problem which is to see that the country lives. Professor Dean predicted military service of an educational nature, which shall train for national service. The Boy Scout movement was praised, as the basis of developing physical and mental fitness for service.

Representatives of the different clubs gave brief accounts of their activities. Mr.

Traua, of the School Crafts Club of New York, made an appeal for farm service as a way to serve our country in the summer months.

Professor Dean also spoke at one of the general sessions on the "Reconstruction Problem." He described clearly the three main phases of the work: Occupational therapy, curative shopwork, and industrial training. Thru his broad experience and his recent visits to hospitals in Canada, his descriptions of the cases and methods of handling them were most instructive. He suggested the importance of manual arts teachers giving attention to this work, even to the extent of turning the school shops over to the treating of soldiers on their return.

On Saturday morning, Phillip Little, of Boston, talked on "Camouflage" and illustrated his remarks with blackboard drawings. E. E. MacNary's talk on the "Training of Ship Builders in the Art of Teaching" was along the lines presented to the convention of the National Society of Industrial Education at Philadelphia as reported in the April number of this magazine. The illustrations included some new views of many of the processes involved in

the actual building of a steel ship.

Douglas C. McMurtrie's description of the work of industrial training of disabled soldiers was profusely illustrated, not only with stereopticon slides, but also with moving pictures showing men equipped with artificial arms and legs, at work in factories and on farms. This work in Canada, England, and France, has resulted in a large proportion of men being so trained, that in spite of their disabilities their earning capacity has become greater than before they entered the army.

A number of the prominent dealers in school supplies held exhibitions at the Convention head-quarters. At the Boardman Trade School, the Domestic Arts Department exhibited war foods and Red Cross sewing. At the Public Library the exhibit of drawings from the elementary schools in France was wonderfully fine. The technique, design, and color of the work shown was such as could be produced only by a nation of art lovers.

Among the officers for the coming year are:

Augustus F. Rose, President,
Frederick P. Reagle, Vice-President,
H. Almen Wentworth, Treasurer.

THE AMERICAN'S CREED

I believe in the United States of America as a government of the people, by the people, for the people, whose just powers are derived from the consent of the governed; a democracy in a republic; a sovereign Nation of many sovereign States, a perfect Union, one and inseparable; established upon those principles of freedom, equality, justice, and humanity for which American patriots sacrificed their lives and fortunes.

I therefore believe it is my duty to my country to love it; to support its Constitution; to obey its laws; to respect its flag, and to defend it against all enemies.

—WILLIAM TYLER PAGE.

EDITORIAL REVIEW OF THE MONTH

TEACHER-TRAINING COURSES AT BRADLEY

A VERY important extension of the teacher-training facilities of Bradley Institute has just been announced. This has come as the result of an extended study of present and probable conditions in the teaching field made by Professor Albert F. Siepert, and the desire of the Institute faculty and trustees to meet new demands in this field as fast as they arise. A review of the requests that have come to the Institute for teachers during the past two years, and of changes due to the advent of Federal aid for vocational education have led to the conclusion that the Institute should train the following types of teachers: (a) Those who are qualified to meet the needs in small communities where sufficient funds are not available for a full-time teacher of industrial work; hence the teacher must be able to teach one or two academic high school subjects. State laws require that such teachers have four years of training above high school. (b) Those who can successfully handle two or three industrial subjects such as are given in junior high schools, agricultural schools and township high schools. (c) Specialists in woodworking, in metalworking or in drafting for large city high schools. (d) Supervisors and administrative officers in the field of manual arts and vocational education. (e) Teachers of manual training in the elementary school. (f) Men of approved trade experience for vocational schools receiving Federal aid.

To meet the demands in all these directions several new four-year programs of studies have been developed from the former three-year programs; the former two-year program has been revised; and a new one-year program announced for men with extended trade experience.

One of the fundamental ideas behind these programs is that a man must know thoroly what he is to teach before he attempts to teach it, whether he obtains that knowledge thru experience in industry or in the school shop. Under the present conditions the supply of men that can be obtained from industry is insufficient and consequently time must be given in school to give such experience. Hence the large amount of time given to the technical subjects in the revised programs. A second idea is that the pedagogy of these programs must be presented in as practical, usable form as possible. A third idea is that a B. S. degree course that contains a large proportion of time given to technical subjects may cost as much in time, thought and real effort and be worthy of as much recognition as a B. S. course in engineering, or agriculture or science, provided the technical courses are made rich in subject-matter and experience and are well taught.

VOCATIONAL EDUCATION IN CHINA

A COPY of *The China Press* from Shanghai tells of the formation of a National Association for Vocational Training in China. The association has already made a good beginning. It aims to establish branches in all the provincial capitals and to open schools. It hopes to open a school in Shanghai in July or August specializing in the training of mechanics and woodworkers. The Ministry of Finance has granted \$5,000 for the work, and the province of Kiangsu has promised \$3,000 annually.

The following is quoted from a statement made by Dr. P. W. Kuo, president of the Government Normal College at Nanking:

Soon after the organization of the association, a commission of Chinese educators went to

Japan and the Philippines for the special purpose of studying the methods and means in vocational education. The findings of this commission, especially the success of the educational experiment in the Philippines, attracted nation-wide attention. As a consequence other commissions of a similar nature followed with the result that the experience of the neighboring islands in the administration of vocational education is made the object lesson for many. In the summer of 1917 a special institute was held in Shanghai under the auspices of the Kiangsu Educational Association during which a series of lectures on vocational education was given to the delegates from the sixty districts of the province. In the fall of the same year a national conference of the heads of schools of agriculture, industry and commerce was held in Peking for the consideration of problems of improving and extending their work. During the national conference of provincial educational associations held in Hangchow, the question of vocational education was made the central theme of discussion and important recommendations bearing on the question were made by the conference to the Ministry of Education. The conference further recommended that vocational education be made a chief topic of study by all the provincial educational associations during the coming year, and that the results and attempts made are to be reported to the conference at its next annual meeting. Altho it is yet too early to formulate any definite program out of the discussions and trials that are being made, certain general tendencies of the movement are easily traceable.

It is true that many suggestions may be learned from abroad, but practical devices and working methods can be borrowed only to a comparatively slight extent. For the future China must work out the problems of vocational education by herself, with, of course, the largest possible co-operation from the Christian educators of China.

AMERICAN-MADE TOYS

PROMINENT representatives of the toy industry met at luncheon in New York City on Friday, April 26th, to discuss steps that may be taken to raise the standard of the American output of toys, both in color and design. This meeting was organized by the Art Alliance of Am-

erica which recently held an exhibition of American-made toys in its galleries. H. C. Ives, president of the Toy Manufacturers Association, said that new ideas were much to be desired, pointing to the design for a metal horse which was made 20 years ago and is still being duplicated by the thousands in the trade. On the other hand it was pointed out by R. H. McCready, editor of "Playthings," that there was no reason why America should not have a huge toy exhibition each year similar to exhibitions of this type which are held abroad. "This," said Mr. McCready, "will help to educate the manufacturer, the designer and the public." H. S. Fisk of "Toys and Novelties" urged methods to bring out new ideas.

The Art Alliance of America is particularly interested in stimulating the development of good designs for toys. It purposes to hold, during the coming year, an exhibition in which new toys of all descriptions will be shown. Several substantial money prizes were pledged at the luncheon, and it is of interest to note that one of these was offered to the high schools of New York City for designs of flat toys, that is, toys cut in the silhouette and gaily painted.

DR. ETTINGER'S ELECTION

THE election of Dr. William L. Ettinger as superintendent of public schools in New York City would seem to insure a sympathetic attitude toward the development of the manual arts and vocational training in the schools of the Atlantic metropolis. If Dr. Ettinger lives up to his record and his expressed intentions, there will be no radical overturning or reorganizing of the New York school system, but there is likely to be some rational progressive development due to forces acting within the system itself. It is quite probable that within his administration

some vital changes will have to take place in the manual arts work in the elementary schools. Such changes, we hope, will soon be due in other parts of the country also. The time ought to be near at hand when school principals and superintendents, and boards of education as well, will recognize the futility of continuing the policy of giving a taste of manual arts and then

and electrical construction, besides four years of work in mechanical, machine and architectural drawing.

HERE is a hint from some of our business friends: If you are going to need equipment or supplies or books next fall, order them now. It will cost no more, and perhaps less. By doing so



HOUSE BEING BUILT BY BOYS OF THE STATE TRADE SCHOOL, PUTNAM, CONNECTICUT.

withholding the nourishing meal. There seems to be evidence that Dr. Ettinger realizes the situation.

SOME of the principals and supervisors who are unable to find enough teachers to meet the demands for next year will be glad to know that twenty-one young men of the fourth-year class of the Lane Technical High School, Chicago, have volunteered to take an intensive course of teacher-training under Albert G. Bauersfeld to fit them to teach manual training in the fall. All these men have had four years of technical work, including carpentry, cabinet making, wood-turning, foundry work, forging, machine shop work

you will make it easier for the manufacturer to supply your wants. In fact, you may not get them at all if you wait until just before you want to use them. It will help the railroads too. To order your school supplies as well as your coal early this year is rendering a public service.

THE cut on this page shows a real practical project being worked out by the boys of one of the State trade schools of Connecticut. The boys were told that a six-room house was wanted on this spot. They went thru the process of making rough sketches, plans, specifications, and bids, and then the contract was awarded to them.

WASHINGTON CORRESPONDENCE

TRAINING CONSCRIPTED MEN

THE War Department is prosecuting vigorously the work of giving mechanical training to enlisted men in a number of trade schools, engineering colleges, technical high schools, and other institutions. By May first it was reported that approximately 7,500 men were under training in 23 institutions, with a substantial number of new quotas under contract to begin instruction on May 15th.

The training is being given in short intensive courses of eight weeks each, the classes meeting eight hours daily except Sundays and holidays. The War Department is providing this technical training for soldiers in the service, who will be under discipline and on pay and subsistence during the period of their training. For the purpose of training these men the Department desires to make use of facilities now in existence, thus offering the various educational centers of the country the opportunity to perform an important patriotic service.

Institutions are not commandeered, or placed under compulsion of any kind. Those which volunteer their services are visited by inspectors to see if proper conditions can be provided. The necessary conditions have been outlined as follows:

1. Men will be sent to civilian institutions for technical training in units of from 100 up. Few units will number less than 200 or more than 2,000.

2. For the maintenance of effective military discipline it is necessary that the men be housed and fed in groups of approximately 100 to 500. In training centers already established this requirement has been met in various ways; for example, by utilizing a dormitory or a hotel, by the conversion of a large hall, gymnasium, or armory, or by the erection of temporary barracks.

3. Sufficient space suitable for military

drill and located at a convenient distance from the quarters, should be available.

4. Institutions providing training and arranging housing and feeding facilities will be compensated at a reasonable per diem rate for each man, which is intended to cover actual costs.

TRAINING MUST BE THOROLY PRACTICAL

THE training required is such as will give the men some practical skill in the fundamental operations of selected trade processes, including carpentry, metalworking, blacksmithing, automobile work, and other mechanical activities useful in the Army. Eight weeks is not sufficient time in which to teach these operations to novices and make skilled mechanics of them. The War Department emphasizes the fact that it does not send these soldiers to the schools in order that they may become *skilled mechanics*, but in order that the schools may give some mechanical and technical training to *soldiers*. There is an important distinction here which should be carefully noted by all concerned.

Only fundamental training is possible in this emergency, and that training must be thoroly practical rather than theoretical. The work required includes the following courses, for which the War Department will provide definite directions and outlines. Each institution will undertake instruction only in those lines for which it possesses or can procure adequate facilities.

1. *Auto driving and repair.*—Driving motor vehicles of various types, and making all general repairs.

2. *Bench woodwork.*—Splicing frames, joinery, pattern-making, and fine woodwork.

3. *General carpentry.*—Use of the usual carpenter's tools and materials; practice in rapid rough work with hatchet and saw to qualify the man for building and repairing barracks, erecting concrete forms, rough bridge work, etc.

4. *Electrical communication.*—Construction

and repair of telephone and telegraph lines; repair, adjustment and operation of telephone and telegraph apparatus; cable splicing.

5. *Electrical work*.—Installation, operation, and repair of electrical machines; inside wiring; power circuits.

6. *Forging or blacksmithing*.—Jobbing blacksmithing; motorcycle, automobile, truck, gas engine, and wagon repairing.

7. *Gas engine work*.—Reconstruction and repair of automobile, motorcycle, and airplane engines.

8. *Machine work*.—General machine-shop-work on lathe, drill-press, shaper, planer, miller, grinder, etc.

9. *Sheet metalwork*.—Coppersmithing and tinsmithing; soldering, brazing, and general repairing.

Other courses will be added as the needs of the Army may require.

Reports which have come from the institutions thus far indicate that the men detailed for this training are a miscellaneous group, whose previous experience represents a wide range of occupations, for the most part non-mechanical. The number of men who have had experience in any of the trades in which instruction is given is almost negligible. As might be expected, these men are taking hold of the various lines of shopwork to which they are assigned with the greatest enthusiasm, and are "working like beavers," as one inspector expressed it, to make the time count for the most possible. They appear to be having the time of their lives, and are making the most of the opportunity to get hold of tools and construct things. This enthusiasm and keen native interest will prove important factors in the achievements of these two-months courses.

CHANGES IN ADVISORY BOARD

AS noted in these columns last month, the Committee on Education and Special Training consists of three Army officers. These are: Lt. Col. Robert I. Rees, General Staff Corps; Lt. Col. John Wigmore, Provost Marshal General's Of-

fice; Major Grenville Clark, Adjutant General's Office. The executive secretary of the Committee is Dr. William H. Lough.

Of the Members of the Advisory Board named last month, one has resigned, James P. Munroe, and two have been added; Dean Herman Schneider, College of Engineering, University of Cincinnati; and Hugh Frayne, general organizer, American Federation of Labor, New York City.

FIELD FORCES ORGANIZED

DURING the month an organization has been perfected for dealing with the institutions to which the soldiers are detailed. The country has been divided into ten districts for administrative purposes, as shown in the accompanying map. For each district an inspector or field agent has been appointed to have general charge of the educational features of the enterprise, as follows:

District 1. Arthur L. Williston, director, Wentworth Institute, Boston, Mass.

District 2. Frank E. Mathewson, director, Industrial Education Department, Dickinson High School, Jersey City, N. J.

District 3. Stanley A. Zweibel, director vocational education, public schools, Bethlehem, Pa.

District 4. James A. Pratt, director of shops, Williamson Free School of Mechanical Trades, Williamson, Pa.

District 5. Dean P. B. Woodworth, Lewis Institute, Chicago.

District 6. Robert W. Selvidge, Peabody College for Teachers, Nashville, Tenn.

District 7. Dean A. A. Potter, engineering department, State College of Agriculture and Mechanic Arts, Manhattan, Kans.

District 8. H. C. Givens, director industrial education, State Manual Training Normal School, Pittsburg, Kans.

District 9. Frank H. Shepherd, Oregon Agricultural College, Corvallis, Ore.

District 10. James A. Addicott, principal, Polytechnic High School, San Francisco, Cal.

The Department of the Interior has been asked to co-operate in the organiza-

tion of an Editorial Division for the preparation of teachers' manuals and outlines of courses of instruction, and for this purpose the Commissioner of Education has detailed to the War Department the Bureau's specialist in industrial education, W. T. Bawden.

HEARINGS ON BILLS FOR EDUCATION OF DISABLED SOLDIERS

DURING the first week in May joint hearings on bills providing for vocational education of disabled soldiers and sailors were held by the education committees of the Senate and House of Representatives. No opposition to the measures developed at the hearings, and at their conclusion Senator Smith and Representative Sears are reported to have said that they would seek to report the bills at an early date.

The bills provide that the Federal Board for Vocational Education shall be the agency for administering the educational features of the plan. The soldier would remain under military discipline, and under the control of the Surgeon-General, until the completion of the necessary medical and surgical treatment. After discharge from the service the man would be under the control of the Federal Board until returned to civil life prepared to earn his living in some occupation. The representatives of the Federal Board would also serve in an advisory capacity in planning and conducting educational activities for the men while still in the hospitals.

The American Association for Labor Legislation is urging an amendment to these bills providing vocational education for the maimed victims of industrial acci-

dents. It is maintained by the Association that there are more than 100,000 industrial cripples in the country today, who could be wholly or partially restored to skilled trades. Enlarged application of the machinery provided for in these bills would meet this great need, the arrangements to be shared proportionately between the Federal government and the states. Passage of the bills thus amended, it is claimed, would increase the supply of highly essential skilled workers, and bring new hope to the convalescent.

DAYLIGHT SAVING

NOW that the whole country has become adjusted to the change in clock-time by which our days are apparently made longer, and no hardship or inconvenience has befallen any one, we look back with good-natured amazement at the excitement into which some people allowed themselves to be worked during the period of preliminary discussion. The following communication from a working girl, signed "Disgusted," which appeared in the Richmond, Va., News Leader, March 19th, is a gem:

I would like to know who's the people that is trying to get above God. What will people try to do next? Who do they think that is going to work at 6 o'clock in the mornings? I am a working girl myself, and I think that a strike will break that up. We working girls are going to decide that later. I have heard of things before, but that's got me. We refuse to take that up. I thought God was above all, but someone is trying to get above Him.

Will the time ever come when it will be possible by the processes of education to enable the people to think themselves thru a hypothetical situation of this kind without needless alarm and uncertainty?

"Noah was 600 years old before he learned to build the ark. Don't loose your grip."

OPEN QUESTIONS

"There is more to be said on this subject."

VERTICAL OR SLANTING LETTERS

My Dear Editor:

In answer to yours in the February number, "Are these propositions sound?" referring to the article, "Vertical or Slanting Letters," by T. T. L., Palm Beach, Florida:—

I agree with the writer that, "inclined letters are most common in machine drafting and vertical letters almost universally used in architectural drafting." It is generally left to the individual architectural draftsman to use the style of lettering he is most proficient in, whereas the chief draftsman almost invariably decides whether vertical or inclined lettering is to be used in the mechanical drafting room. The draftsman must letter according to the standards of that particular drafting room.

In our school, with the students who take drafting as a trade, which is mechanical, vertical lettering was adopted this year; while with the students in the other trades, receiving their related trade drawing in a different room, inclined lettering is used entirely.

Mr. T. T. L. claims that it is as easy to pass from vertical to the inclined as from the inclined to the vertical. I do not agree with him on this point. I firmly believe that it is more difficult to pass from the inclined to the vertical than from the vertical to the inclined. That is the reason we adopted vertical lettering in our drafting room this year, believing that we should train our students who expect to become draftsmen, in the most difficult, which is vertical lettering.

From the point of appearance, one is just as good as the other, this being a matter of individual taste.

If we consider lettering from the viewpoint of speed, which we must instill into the students, inclined lettering is the style that should be used. A student can letter more rapidly and neatly using the inclined rather than the vertical letter. Should the stroke of the vertical letter be out of line in the slightest degree, it is immediately noticed, the resulting appearance being poor; while it is not so noticeable when a slight variation is made on the stroke of the inclined letter.

When I commenced, and during my grammar-school education, vertical writing had just been introduced and used, but today these

same schools have gone back to inclined writing, as it has been found by experience that it is very much easier for a child to write neater and speedier, using the inclined rather than vertical writing. This applies to lettering also.

Robert W. Selvidge's article on "Speed," in the February number of your magazine clearly states that, "it is just as easy to develop the habit of performing the operation speedily as slowly," and, "psychologists agree that the more rapid workers are the more accurate."

In order to attain speed in this era of "rush," one step in that direction is inclined lettering.

G. ADOLPH JOHNSON,
Instructor in Related Trade Drawing, Boys' Trade School, Worcester, Massachusetts.

SELECTION AND CARE OF DRAWING INSTRUMENTS

The care of instruments is a very important matter in the training of a draftsman. First, it must be remembered that the points, pens and joints are the most important parts. Under no consideration should the points of the dividers or nibs of the pen, be jabbed into the board. Nor should the thumbscrews be worked needlessly back and forth on the thread.

All tools should be perfectly dry before placing them away. Perspiration from the hands will tarnish them in a short time. They may be cleaned by applying a soft rag or chamois. Occasionally a slightly oiled rag, may be used to clean them off. Care should always be exercised in not placing too much oil on, as it will soil the hands, thereby causing the paper to become spotted.

All tools should be placed in some kind of a case. By so doing they may be kept clean, and their absence is more readily noticed. Often cases are merely a soft piece of leather with or without pockets in which the instruments are loosely rolled. With good care the qualities of well-made instruments will last. After their long use, one may be so familiar with the movement of every part, that they are adjusted instinctively.

The best instruments are made with hard-rolled German silver body, steel threads and joints, and with tempered steel springs and joints. Good instruments are never nickel plated, nor have they cast or coined metal

body with iron points and joints. They are light in weight, convenient to handle and have delicate adjustments. All parts should have an equal fine-grain surface without a burnished gloss.

Poorer grades of instruments are often clumsy in design, heavy, with joints and movements not uniform. And as often they are small, light, and with joints that are easily twisted out of shape. The joints will not stand the wear usually given a set in actual practice, because of the softness of the metal. The nibs on the pens are a hindrance to good workmanship.

South Haven, Mich.

—EARL R. GILBERT.

THE CHECK SYSTEM OF LETTING OUT TOOLS.

Mr. Editor:

The writer has had occasion to read Mr. Schneider's article as to the best method of keeping tools in the high school shops. The writer has had considerable experience along this line, and in reference to the check system which Mr. Schneider advocates as being the best, the writer has the following suggestions to offer.

1. Confusion—

There is bound to be a certain amount of confusion and delay in getting checks and tools. This confusion occurs at three different intervals; before session, during session and at conclusion of session.

2. Time Consumer—

Boys are being robbed of their time. Teaches them to walk instead of working. Walking is apt to be overdone.

3. Space Consumer—

Cabinet and wall racks and tool racks occupy valuable working space. Creates an untidy appearance. Space is a valuable asset in a shop.

4. Checks—

Means an extra care and expense.

5. Care of tools—

Tools are apt to be dropped in handling. Too many unnecessary tools are apt to be taken. No individual pride is taken in their care and tools are apt to be thrown promiscuously upon the bench thereby giving the benches an untidy appearance unless a bench rack or some other exterior bench idea is provided to hold the tools during working hours.

The writer believes it is good practice to

charge a fee of 5 or 10 cents, payable monthly, termly or yearly as the individual case demands. This fee may be called tool insurance.

The old method of fastening the tool rack to the bench and giving proper housing for the most frequent used tools is the best method which the writer has tried. In this method the boys have an individual pride in keeping their tools in excellent condition. This is the method generally used in commercial shops. The tools are always handy to the workman.

After the teacher has become accustomed to the arrangement of tools on the benches it takes little time and effort to detect any missing ones. This can be done by glancing over each bench before dismissal of the class.

—W. A. C.

A KNITTING NEEDLE PROBLEM

There has been considerable discussion of the making of knitting needles in the past few months. We have made about two hundred pairs. We think we have a very satisfactory scheme, and we are willing to pass it on for the use of others.

We bought the ordinary $\frac{3}{8}$ " dowel rods, cut them to desired lengths, pointed them on a pencil sharpener, and in place of using an upholstery tack on one end, we made balls or knobs of wood and put them on, making a very satisfactory finish.

In making the balls, we first turned up an ordinary cylinder of maple about $\frac{1}{2}$ " in diameter. Then we cut these in 2" or 3" lengths and took a chuck from the drill press in the machine shop, which would fit into the spindle of our turning lathe and would take in these small pieces. Next we took an ordinary $\frac{3}{4}$ " gouge and ground it with a U-shaped cutting edge. Then by one operation a round ball could be turned. Before cutting the ball off from the stock another chuck containing a $\frac{3}{8}$ " drill had been inserted in the tailstock and a hole was bored the required depth in the ball. The ball was then cut off and placed on the needle with a drop of glue. Finally the entire needle was sanded, and when completed, the needle had the appearance of a real workman-like product.

After a little practice the boys became quite skillful in turning up the balls. One of our boys would average about two per minute.

O. M. MERRIAM,

Supervisor of Manual Arts, Whiting, Indiana.

SHOP NOTES AND PROBLEMS

ALBERT F. SIEPERT, Editor.

BUILDING THE SHOP

THE New Mexico Normal University, Las Vegas, N. M., needed a shop, while the teacher and woodworking class wanted a practical job. As a result the building shown was designed, erected, wired for light and power, and machines set in place by the students. The building measures 40' x 80' with a 10' side wall, and has a self-supporting roof

designed in the department. The machines are set in concrete foundations which in turn rest upon solid rock three or four feet below the floor. The job was effectively handled by dividing the class into groups. Each group elected its own foreman. Four or five of these foremen were given detailed information in procedure who in turn instructed their gang.

CLYDE D. WILLIAMS, Director Manual Arts.



THE SHOP.



TURNING END OF THE SHOP.

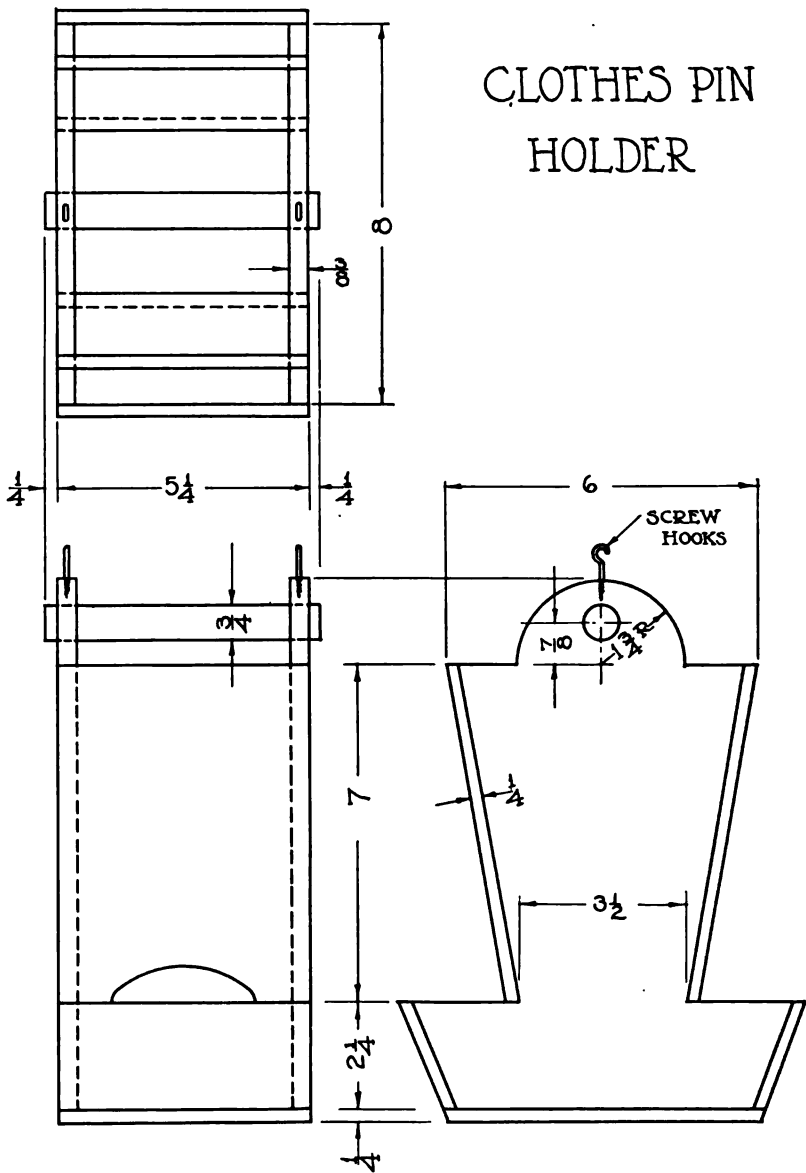


MACHINERY END OF THE SHOP.

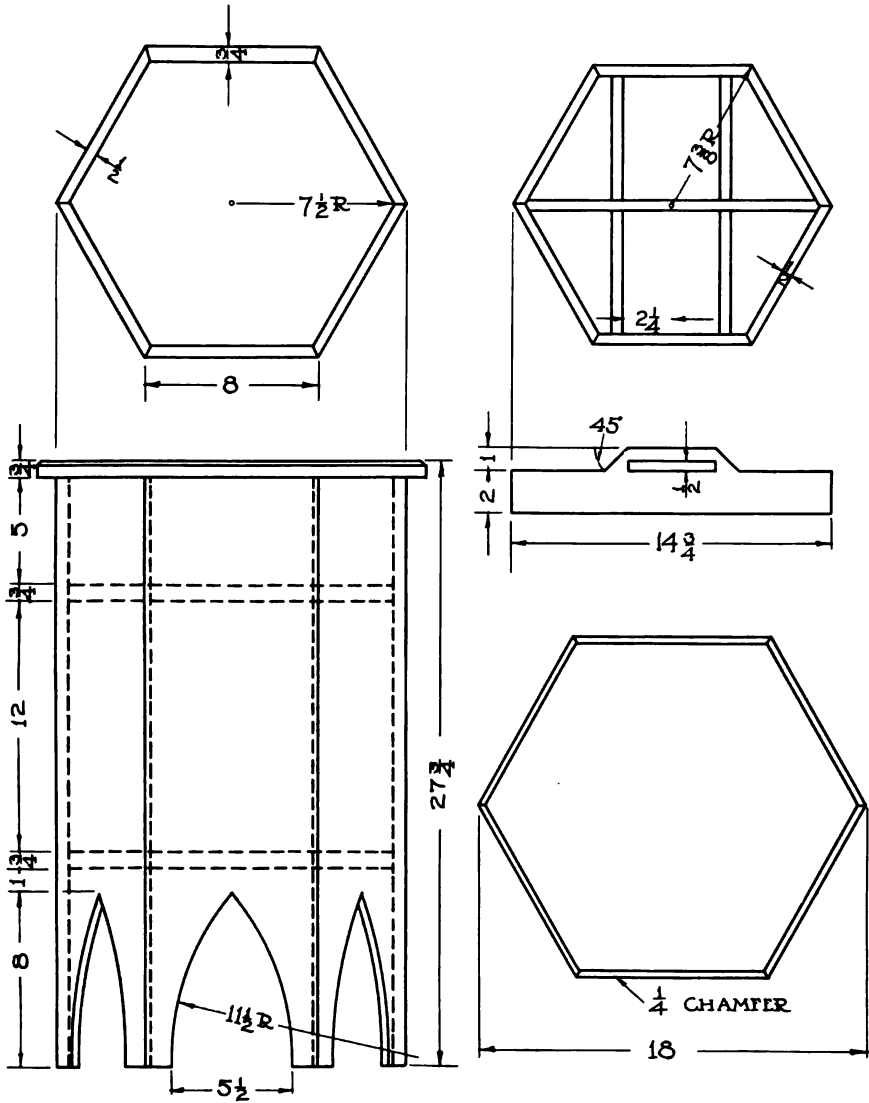


WORKBENCHES.

CLOTHES PIN
HOLDER



SEWING CABINET .





CLOTHES-PIN HOLDER



TROPHY SHIELD

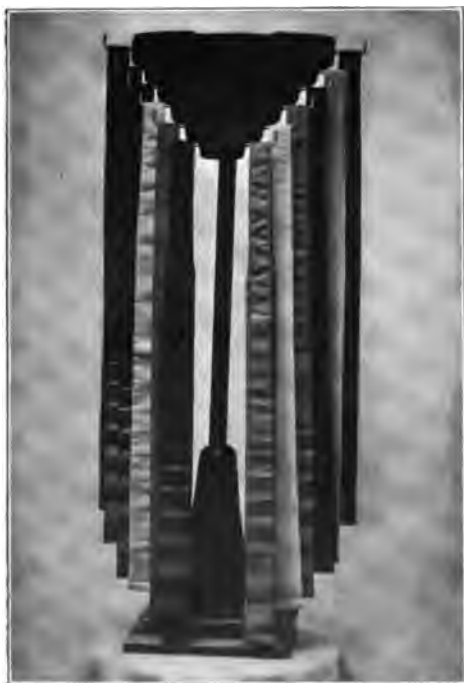
This project was made and designed under the direction of T. M. Conrey, Wichita Falls, Tex., for presentation to the winning team of the District Track Meet.

CLOTHES PIN HOLDER

This makes a problem which will be of service to the housewife. Basswood or pine should be used. Care should be taken in nailing the pieces together that the wider pieces are not split. When the pieces are assembled, apply two coats of shellac and the holder is ready for use.

SEWING CABINET

An interesting modification of the octagonal taboret is shown in the accompanying drawing. The top is hinged to one side ($\frac{3}{4}$ " in thickness) to get at the tray holding sewing materials. The height may be varied to suit individual needs. The top may be decorated with an inlay. This project involves skilful tool use in its construction and affords a test of the ability of the workman such as is not evident in many of the more common projects. Bowling Green, O. —H. E. MURLIN.



TIE DISPLAY RACK

This project was made in quantity lots for the use of merchants handling gentlemen's wearing apparel. Cleveland, O. —EDWARD HILGREN.

CURRENT PUBLICATIONS

War Time Occupations, by Florence O. Bean, Boston Public Schools. Sold by J. L. Hammett Company, Cambridge, Massachusetts. Size, 7 x 5 in.; 42 pages, paper covers, price, 25 cts.

This little book presents a collection of grade-school problems in paper and cardboard which are especially interesting on account of the war. They would be good problems at any time, but they are especially good now because each one has a use connected more or less directly with our soldiers and sailors. The collection is an answer to the children's question, "What can we do to help?"

Elementary Machine Shop Practice, by T. J. Palmateer, instructor in machine-shop work at Leland Stanford Junior University, Stanford University, Calif., 1918. Size, 8¾ x 5¼ in., 57 pages; paper covers, price, 75 cts.

This is a pamphlet textbook for beginners in machine-shop practice. "The main object," says the author, "is to bring a student with no previous shop experience to the point where he is able to do some real work." It treats of vise, shaper, drill press and milling-machine work. Last year the author issued a similar pamphlet on "Elementary Lathe Work." Both are clear, simple, direct, to the point.

Rural Manual Training, by E. A. Hollingsworth, superintendent of schools, Doty, Washington. Normal Publishing Co., Centralia, Washington, 1918. Size, 8 x 5¼ in., 93 pages; paper covers, price, \$1.25.

This is not so much a book as it is a conversation—a story by an enthusiast who tells you how he tried to answer such questions as, "How can I begin manual training without funds? How may I overcome the serious opposition of my district? Have my patrons the right to demand manual training when I have so many grades and pupils? What can I accomplish in one small, crowded room? Is it possible to offer manual training without bench equipment?"

The two half-tone illustrations in the book are the best answer to these questions, tho not the only ones he gives. Several drawings of problems are shown.

Projects in Woodwork and Furniture Making, by Freeman G. Chute, State Normal School, Bellingham, Washington. Size, 8½ x 11 in. oblong; 60 blueprint plates; price, \$3.50.

This is a good collection of blueprints of manual-training problems. They are well selected, (some of them probably original) well arranged, and well drawn. They cover the whole range of woodwork from the coping saw "bear" to a dining-room table with extension top. One of them gives a new treatment of designs of mouldings and handles for serving trays. Another is a sheet of one-piece projects that would be especially suggestive to an instructor who is teaching the first use of the plane.

How to Read Drawings, by Vincent C. Getty. Published by J. B. Lippincott Company, Philadelphia, 1912. Size, 9½ x 6¼ in., 64 pages; price, \$1.00.

As its name would suggest, this book was written to help workmen in their efforts to learn to read working drawings. It considers the views, structural steel shapes, bolts, nuts, rivets, drawings of structural details, and it ends with architectural sections and elevations.

English and Engineering, by Frank Aydelotte, professor of English in the Massachusetts Institute of Technology. McGraw-Hill Book Co., New York, 1917. Size, 7¼ x 5 in., 390 pages; price, \$1.50 net.

The aim of this book is to furnish reading material for technical students which will serve the double purpose of helping them to express themselves better in writing and speaking and of broadening their outlook on life. It contains well-selected writings from the best writers on the "engineering profession, engineering education, pure science and applied, science and literature, literature and life, and writing and thinking."

The collection is not only valuable for students, but also for teachers who like choice reading.

How the Present Came from the Past, Book II. The Roots in Oriental Life. By Margaret E. Wells, Primary Supervisor, State Normal School, Warrensburg, Mo. Published by Macmillan & Co., New York City, 1917; 5½ x 7½ in.; 274 pages; illustrated.

The contribution of oriental countries to present-day civilization is clearly traced in this volume, the nations playing the most important part being the Egyptians, Babylonians, Assyrians, Persians, Hebrews and Phoenicians.

It is intended as a supplementary reader for the elementary schools

RECEIVED

Promoting Self Improvement in Trade Teachers. A small pamphlet issued and distributed by D. J. MacDonald, associate professor of vocational education, Indiana University. This booklet is a result of his experience in supervising the work of trade teachers. Mr. MacDonald's address is 117 Merchants' Bank Bldg., Indianapolis, Indiana.

Camp Liberty, a farm cadet experiment. Bulletin No. 7, issued by the Bureau of Educational Experiments, 16 W. 8th St., New York City. Price, 10 cents.

The Use of Farm Labor During the War, by W. F. Handschin and J. B. Andrews. Extension circular No. 20, issued by the College of Agriculture, University of Illinois, Urbana, Illinois.

Emergency Agricultural Classes, Bulletin A, Series I, issued by the Indiana State Council of Defense in co-operation with the State Board of Education and the United States Boys' Working Reserve. Copies can be obtained from State Council of Defense, State House, Indianapolis, Indiana.

Organization and Training of the Labor Supply in the Schools. A bulletin issued by C. P. Cary, State Superintendent of Public Instruction, Madison, Wisconsin.

Vocational Education—Minimum requirements and general regulations for all-day, part-time, and evening schools under the Smith-Hughes Act, issued by the State Department of Education, Augusta, Maine.

Plans for Organization and Administration of the Smith-Hughes Act. Published by J. A. Churchill, Superintendent of Public Instruction, Oregon.

Plans Concerning the Wisconsin System of Vocational Training. Presented to the Federal Board of Vocational Education. Published by the State Board of Vocational Education, Madison, Wisconsin.

An Educational Survey of Janesville, Wisconsin. Issued by C. P. Cary, State Department of Public Instruction, Madison, Wisconsin. This includes a chapter entitled, "The Problem of Industrial Education."

Proceedings of the First Annual Meeting of the National Society for the Promotion of Occu-

pational Therapy. Published by the Society at Towson, Maryland.

Emergency War Training for Gas-Engine, Motor-Car and Motorcycle Repair Men, Bulletin No. 10, issued by the Federal Board of Vocational Education, Washington, D. C.

Agricultural Education—Organization and Administration. Bulletin No. 13, issued by the Federal Board for Vocational Education, Washington, D. C.

Machine Industry and Community Life. This is one of the valuable "Community Leaflets" edited by Professor Charles H. Judd and Leon C. Marshall of the University of Chicago, and issued by the Bureau of Education, Washington, D. C. This series of leaflets deserves wide reading in the schools.

Government Policies Involving the Schools in War Time. A pamphlet signed by the United States Secretary of War, Secretary of the Navy, Chairman of the Public Service Commission, Secretary of the Interior, and the Commissioner of Education, issued by the U. S. Bureau of Education, Washington, D. C.

Joint Report of the Furniture Designers' Committee of the Furniture Manufacturers' Association of Grand Rapids, Michigan, and a Committee appointed by the Board of Education to consider the work done in manual training in the public schools. Printed by the Board of Education, Grand Rapids, Michigan.

Report of the United States Commissioner of Education for the Year Ending June 30, 1917. Volume I and II. This report contains a chapter on education and the war, and another chapter on educational surveys.

Style Book and General Information, by Albert E. Davis. Published by Jones & Kroeger Company, Winona, Minnesota. This pamphlet is the third edition of a 46-page work that is very useful for printers, proof readers, authors, stenographers, and business men. It may be used also as a textbook.

Beginning and Developing a Rural School. by Amanda Stoltzfus. Bulletin No. 1729, University of Texas, Austin, Texas.

Vocational Teachers for Secondary Schools—What the Land Grant Colleges are doing to prepare them. By Chester D. Jarvis, specialist in Agricultural Education, United States Bureau of Education, Washington, D. C.

Statement of Policies. Bulletin No. 1, issued by the Federal Board for Vocational Education, Washington, D. C.

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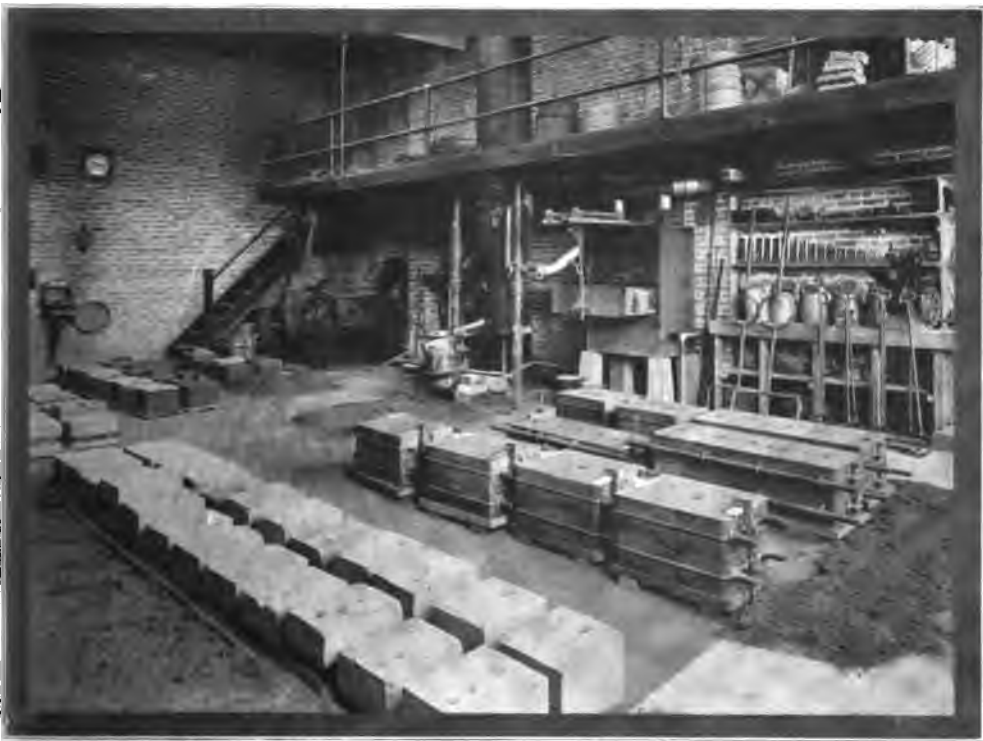
OCTOBER, 1917

No. 2

MANUAL TRAINING MAGAZINE

DEVOTED TO THE
MANUAL ARTS IN
✿ VOCATIONAL ✿
AND GENERAL
EDUCATION ✿ ✿

SM



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MANUAL TRAINING MAGAZINE

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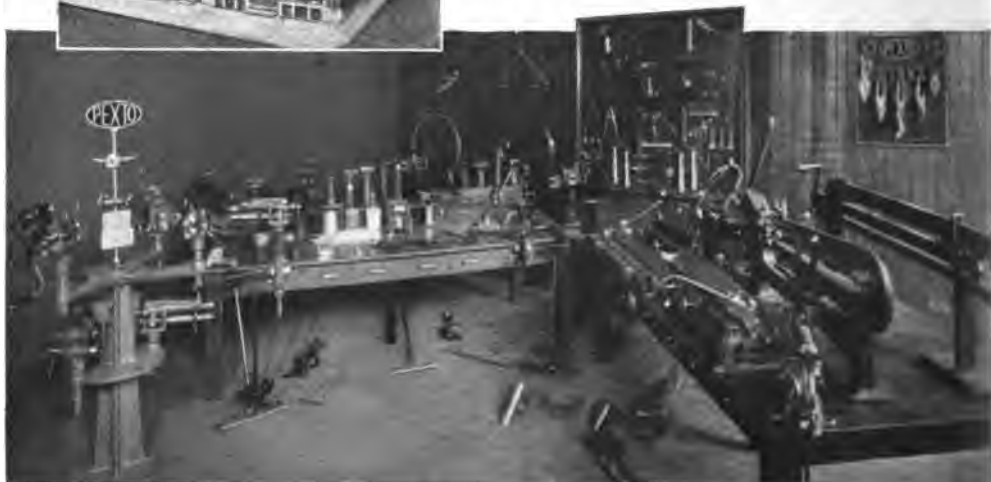
This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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FIELD NOTES

Just as we go to press we learn thru our representative in the Northwest that Ben W. Johnson, director of manual arts instruction in the public schools of Seattle, has been selected by the Federal Board for Vocational Education to act as its regional agent in the states of Washington, Idaho, Utah, Oregon, Nevada, California, and Arizona, with probable headquarters in San Francisco. The special agent will assist the state boards of education in his district in the introduction and supervision of industrial education, as provided for under the terms of the Smith-Hughes Act, and will make a study of such particular phases of industrial education as may be assigned to him from time to time. He will represent the Federal Board on the Pacific Coast.

FARM CADET SERVICE IN NEW YORK CITY.

THE farm cadet service that was carried on the past summer by boys from the New York City high schools more than justified the effort, both from the standpoint of the boys and the farmers for whom they worked. Among the largest camps were those located at Highland, N. J., where 200 boys from the DeWitt Clinton High School were located. H. W. Millspaugh, a member of the school faculty, assisted by eight volunteer teachers, seven of whom were from the DeWitt Clinton school, was in charge. The following report of the work, taken from the *New York Globe*, will be of interest:

"The boys lived in huts, shacks, or berry houses, ten to thirty boys in a camp. They were employed by the day, received their pay from the farmers, and paid their board at the camps, which were self-supporting. Regular menus were prepared and the cost to maintain averaged \$3.50 a week for each boy.

"Mr. Millspaugh selected Highland as a camp site because he was familiar with the section, having spent twelve summers there. He took the first group of boys up late in May, all being excused from school studies on account of war service. The greater part of June was spent in hoeing and in planting beans and other vegetable seeds, and in setting out tomato plants. This

work was continued later than usual because of the lateness of the berry season. On July 5 the boys were picking currants, and on the 12th raspberries. Some of the boys served also as camp helpers, cooks, etc., and were paid regular wages for their work. Women were employed for three to four hours a day in preparing dinner. There was not a single case of illness in any of the camps.

"About eighty of the boys remained upstate until school opened picking berries, tomatoes, and peaches. Director Millspaugh received a large number of letters from farmers testifying to the industry of the boys and to the value of their service.

"A feature of the camp was the presentation of the farm cadet service chevrons to 180 of the boys. The boys marched four abreast down the village streets to the high school lawn where State Commissioner Finley presented the chevrons and complimented the boys on their work. Dr. Arthur D. Dean, spoke, and brief remarks were made by a local business man, a representative of the farmers, and one of the campers.

"The experiment has been a success and will be repeated again next year."

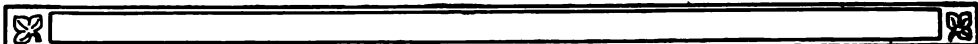
LETTER FROM BOSTON.

My dear Mr. Editor:

Since sending in the article on Wentworth Institute the work with the 1st corps of Cadets (now the 101st regiment of the U. S. Engineers) has developed far beyond the most sanguine expectations held out for it at the time of my writing. It was then expected that the corps would be ordered into camp at Ayer on July 25th. Instead "Camp Wentworth" was established and now 1,600 men, the entire regiment, is in camp on the Institute grounds.

The Institute courses have been continued under most favorable conditions. Field operations have been conducted on the extensive property surrounding the Institute and have involved trench digging, signal tower construction, bridge building with timber and concrete materials, telephone and telegraph installation and electric lighting. The course in road map drawing and military surveying has been most successful.

(Continued on p. VI.)



FIELD NOTES—(Continued from p. V.)

Whole sections of country nearby have been surveyed with only the simple instruments, a board, pencil and compass, and the maps resulting compare favorably with those made by the exact methods. The college professor in charge of this work is convinced that the class room lecture method, usually employed for much of the work in college, is most wasteful of time and that "learning by doing" leads to much greater efficiency.

The war conditions have suggested to the Department of Manual Arts, Boston, ways in which the work of the school children may contribute toward supplying some of the needs of the soldiers. It is planned to make game boards for the games of parcheesi, go-bang and checkers. These will take the place of some other objects in the course in elementary bookbinding as they will be made of bristol board and vellum. The painting may be done as a part of some of the color work in drawing. Checkers and "men" may be made in the woodworking classes from dowels or old broom handles. Paper dominos and wooden dice, cloth bags to hold the checkers and other convenient game materials are all within the ability of the elementary grades. Besides the value gained in the processes of making, the moral gain to the child in being of service makes all of such work during these depressing times decidedly worth while.

The boys in some of the eighth grade classes are making a similar contribution to the Red Cross cause in spending at least two of their manual training periods of two hours working at the Red Cross packing rooms. Here they mail up packing cases, steel tape them for export and fasten covers onto the cases when packed. This work is so planned that the boys work in pairs. Of each pair one boy has had previous experience while the other is new to the work.

This co-operative work between the school children and the Red Cross organization will no doubt develop as the school year advances. The making of splints is under consideration but will not be attempted until we secure definite drawings or samples of just what are needed. These must come from the army surgeons who have already been consulted.

—GEO. M. MORRIS.

(Continued on p. VIII.)

DEVELOPMENTS AT DUNWOODY INSTITUTE.

Among the educational institutions that are endeavoring to meet present-day needs, Dunwoody Institute occupies an important place. A baking department, which includes a modern bake shop with a capacity of 3,000 loaves per day and a complete chemistry laboratory for the teaching of milling and baking chemistry, has recently been installed at a cost of over \$20,000. This department is to be one of the features of Dunwoody, as it will be a national school for baking. In the building construction department, a complete equipment for handling concrete construction has been added. A department for the heat treatment of metals has also been added. Three new linotype machines have been installed in the print shop. Linotype work will be taught to compositors from the trade, but not to day school students until they have had a year's experience after the completion of the day school course. Equipment for the teaching of radio work has been added to the electrical department. This was added as a war measure but will be continued as a regular branch of the day school.

A new department in sheet metal work has been added to the day school. This department was added largely at the request of sheet metal employers, who have entered into trade agreements with the school for the training of apprentices in this line.

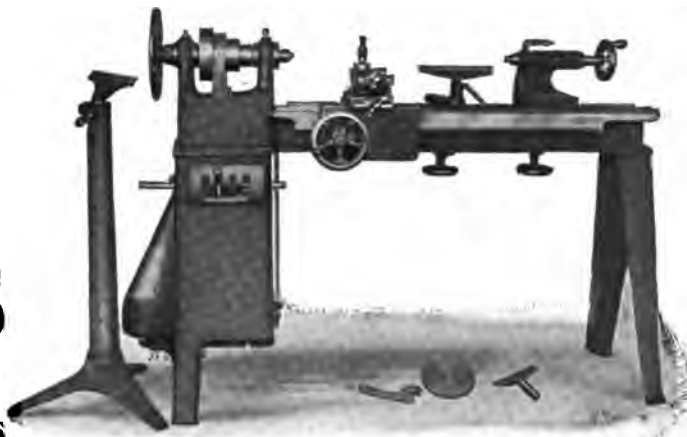
The trade science work has been enlarged for all departments. A power laboratory has been installed where students from the various departments will be given their trade science in steam and electric power and in oil and gasoline. This is in addition to the regular electric and automobile departments.

The evening school will be continued along the same general line of trade extension; that is, only men who are engaged in the trade will be admitted to evening classes. Present plans provide for twenty-four different trades, and accommodations for an enrollment of from 1,500 to 1,700 tradesmen.

APPRENTICESHIP FOR PUBLIC SERVICE.

A suggestion that the apprenticeship system be adopted for training employes for practical

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service in many municipal bureaus was made recently by the Bureau of Municipal Research in its weekly bulletin.

To quote: "When we say training for public service we generally have in mind training for administrative jobs on the public pay roll, and we usually think of a 'desk job.' Out in the field, in workshops, in top floor laboratories, are trained public servants, not so conspicuous perhaps nor so often seen by the citizens, but absolutely indispensable. Modern government employs artisans in every skilled craft.

"In the Electrical Bureau they have a scheme of vocational education. It is a plan of training apprentices, first put into effect in 1910. The chief of the bureau considers the system an unqualified success. Why not apprentices in other bureaus as well."

WOMEN LEARN WELDING.

In the *Christian Science Monitor* has appeared an account of a "school for women welders." This school, known as the Notting-Hill-Gate Workshop was established in London in 1915 by the Women's Service Bureau. It has recently been inspected by the Ministry of Munitions and the expenses of the school are now taken over by the Ministry with the understanding that 20 pupils shall always be in training. The Ministry has added new equipment for oxy-acetylene welding, etc. Up to May, 1917, this school had trained 150 skilled women welders, and pupils are now booked several weeks ahead before the training is completed.

In view of the new demand for men with knowledge of shipbuilding, the vocational school in Springfield, Mass., will probably modify a number of its courses with a view to training students in this occupation. The change will not mean that new courses will have to be instituted, but those who are now working on house carpentry will be enabled to shift to ship carpentry, and the same with the mechanical courses. The change will be voluntary on the part of the students, but it is felt that many will be sure to take up the work. Several special instructors will be secured to teach this new branch of the work.

The *Toronto Globe* is authority for the state-

ment that the first vocational school erected in Canada for the training of returned soldiers was opened at the Freeport Military Sanitarium on September 1. It was built at Kitchener by the Princess of Wales Chapter of the Daughters of the Empire, and is equipped for training soldiers in motor engineering, carpentry and some commercial subjects. The opening of the school was an event of general interest, and was attended by a number of notable Canadians as well as by several American educators.

The boys' auxiliary of the Red Cross Chapter at Nashville, Tenn., has been rendering a fine service during the summer vacation in making boxes and splints for the Red Cross. The board of education allowed them the use of the work room and tools of the manual training department, and J. M. Foster supervised the work. The boxes were made according to the specifications of the American Red Cross Society and were used as packing cases for shipping supplies. The material for the boxes was secured from the dry goods merchants for the most part, although the lumber mills donated quite a little also.

Just before the opening of schools, Governor Edge, of New Jersey, sent out a communication urging that the full standard of attendance and efficiency be maintained in the public schools during the coming year. Following this, Calvin N. Kendall, Commissioner of Public Instruction, addressed a communication to all school officials and the public generally, indorsing the views of the Governor, and emphasizing the fact "that the school is the one organized institution for making democracy safe and capable, and of making the country safe and capable for democracy."

Those who have been impressed with the short-comings of state employment offices, will be interested in learning that at the fourth annual meeting of the American Association of Public Employment Offices, held in Buffalo, July 20 and 21, a portion of the program disclosed the fact that many of those directly concerned with the operation of these offices are awake to the changing needs. Vocational education and its bearing upon employment problems was given consideration in addresses covering such subjects

(Continued on p. X.)

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TEACH the boys to use the saws that are found in shops and factories, that are used by skilled artisans and mechanics. At the same time teach them tool quality. So far as saws are concerned nothing better exemplifies tool quality than the SIMONDS Brand.

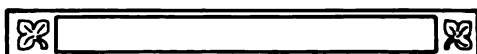
If you want extra copies of our booklet "How to File a Hand Saw" we will be glad to forward them without charge to any Manual Training teacher.

Simonds Manufacturing Company
 "The Saw Makers"
 Established 1832
Fitchburg, Mass.
 Five Factories Twelve Branches

THE SIMONDS BAND SAW
 WARRANTED UNEQUALLED

SIMONDS

"I Tell You It's A Great Saw"



FIELD NOTES

(Continued from p. VIII.)

as vocational education and juvenile departments, vocational guidance as a public school function, vocational guidance and the juvenile placement work of a public labor exchange, and cooperation between employers and the schools in vocational guidance.

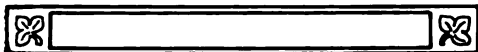
On August 23 an organization to be known as the Connecticut Trade Educators' Association was formed in Danbury, Conn. About forty directors and teachers in the various state trade schools were present and the following officers were elected: President, F. J. Trinder, New Britain; vice-president, S. B. Bassett, New Britain; secretary and business manager, J. F. Johnson, Bridgeport; treasurer, W. J. McKinny, South Manchester.

The Association is open only to directors and instructors in the Connecticut trade schools. Regular meetings are to be held in March and September.

Ten acres of ground have been donated at Chadds Ford Junction, Pa., for the erection of a \$50,000 vocational school for several of the townships in Chester and Delaware counties. Pierre X. Dupont has given the money for the building, and S. B. Walker and A. O. Irwin each gave five acres of ground. The townships involved will pay a share toward finishing the work and completing the grounds. The school will be the first of its kind in either of the two counties and will accommodate a large number of pupils, with a corps of instructors in various subjects. Building operations will be commenced soon.

On September 10 two of the new school buildings in Boston will be ready for occupancy, namely, the Boston Trade School, costing \$280,000 and the Practical Arts School addition, costing \$66,000. The Trade School contains 11 classrooms, one drafting room, an assembly hall, gymnasium, shower baths, locker rooms, etc. The addition to the Practical Arts School contains nine rooms. Seven other school buildings or additions to buildings are under construction and will be opened as fast as they are ready. The entire building program for this year entails an expenditure of over \$1,250,000.

(Continued on p. XI.)



FIELD NOTES

(Continued from p. X.)

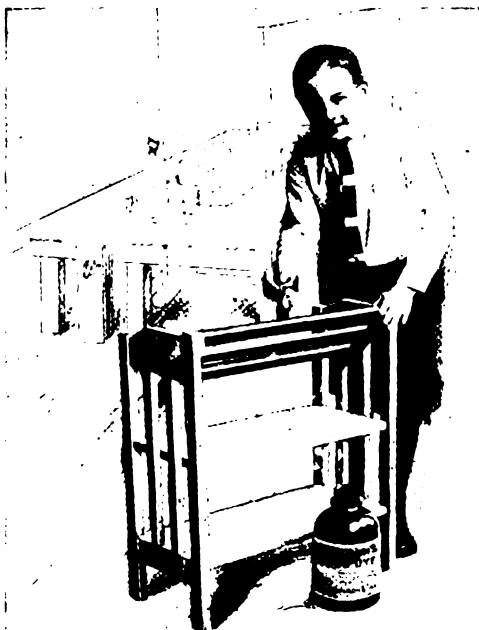
At this season of the year the annual state fairs are centers of attraction. More and more is the educational exhibit coming to be emphasized, until now the character of this department is almost regarded as an index of the progressiveness of the state in all matters of general public welfare. The tendency to exhibit "show work" is giving place to exhibits of average high grade work, which is much more to the point. And this tendency is not confined to the educational department but extends to the departments of agriculture and animal husbandry. In the case of the latter, the reasons for high grade products are pointed out, and thus the fair becomes of educational value to every one interested in these departments.

At the Illinois State Fair this year the educational exhibit was somewhat smaller than usual but the display of high school work in mechanical drawing was larger than usual. The leading competitors were five high schools in Chicago and one in Peoria. The warmest competition was between the work done under E. E. Piper of the Fenger High School, Chicago, and C. W. Chance of the Manual Training High School, Peoria. Their work, which was of a high order won most of the first and second prizes. In the shopwork the competition was between the Crane High School of Chicago and the Manual Training High School of Peoria. There ought to be more schools entering this stimulating competition.

In many parts of the country the movement to emphasize physical training to the extent of extending the day from thirty minutes to an hour, is being urged. The results of examinations for our needed army justify a national preparedness program along this line. In New York and New Jersey legal enactments concerning physical training make necessary readjustment of school programs which will lengthen the school day.

At a meeting held over a month ago, the new Wisconsin State Board of Industrial Education, decided to distribute to the cities asking for state aid 50 per cent. of the total at once, retaining the

(Continued on p. XIV.)



The Finish is Important

SURELY this is a subject which should be given its share of attention, for a beautiful model may be ruined if improperly finished, while the defects of a poorly constructed model are minimized if well finished.

JOHNSON'S WOOD DYE

is just the preparation for staining models. It is very easy to use—goes on like oil without a lap or a streak. It is made in 17 attractive shades—which may be easily lightened and darkened. It dries ready for the finish in 15 minutes—this is particularly advantageous in crowded centers. Over the Dye apply a coat of

JOHNSON'S PREPARED WAX

This gives a soft, artistic finish of great beauty and durability. It is clean and easy to use and economical—no tools or brushes required—all you need is a cheese cloth rag.

No Manual Training Department is complete without our Instruction Book on wood finishing. Use coupon for free copy.



Please send me free and postpaid a copy of your new Instruction Book on wood finishing.

Name

Address

City and State

Fill out this coupon and mail to

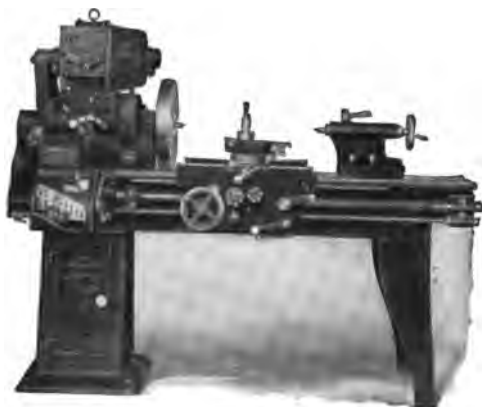
S. C. JOHNSON & SON
"The Wood Finishing Authorities"
RACINE, WIS.



14" MONARCH standard lathe.



14" quick change lathe.



16" Motor driven geared head.



20" MONARCH lathe.

MONARCH LATHES

from 14 to 20 inch swing

offers the ideal lathe for the manual training school. They are furnished in any style and with practically all attachments desired.

MONARCH lathes are low in price yet are as accurate as the highest priced lathes. By installing MONARCH lathes you can in many instances put in **two** monarch lathes for the same cost as **one** of the high priced lathes.

MONARCH lathes are in use in many factories and tool rooms with lathes costing almost twice as much doing just as much and as accurate work.

It is not necessary to pay a high price to secure a good engine lathe.

Let us send you our catalog and list of manual training schools using the Low Priced MONARCH lathes.

**THE MONARCH
MACHINE TOOL CO.
SIDNEY, OHIO.**



TRADE NOTES

This Magazine has frequently urged upon manual training teachers the desirability and even necessity for placing their equipment orders as early as possible. Upon the opening of schools this fall many teachers were confronted with the necessity of being obliged to wait several months before some of their new equipment could be shipped. It looks now as if this condition would not improve until after the war. O. H. Broxterman, president of John Steptoe Co., has informed us that their earliest delivery on milling machines is January, 1918, and on shapers, April, 1918. This firm is giving school orders preference, but it is evident that all manual training equipment should be purchased at least six months before it will be needed.

We understand that deliveries on planers are six to eight months; gear cutters approximately the same time; boring mills, vertical type, anywhere from a year to a year and a half; horizontal type, from nine to twelve months; radial drills from eight to ten months. The only machine tool equipment that can be purchased at the present time for reasonable delivery seems to be lathes of the smaller sizes. As the Government is only beginning to purchase equipment of this kind, and as the flying machine manufacturers are only beginning to buy, it is very evident that before long the deliveries on these machines will also be much longer.

The Greenfield Tap and Die Corporation, Greenfield, Mass., has recently purchased the business of the F. E. Wells & Son Co., who for many years have been manufacturers of screw cutting tools and machinery, chiefly lathes, grinders, screw machines, threading machines, etc. They are best known, however, for their lathes. The Greenfield Tap and Die Corporation manufactures a complete line of tap and die screw plates which are fitted for manual training and technical school use.

A descriptive circular of Starrett's new metal cutting machine No. 950 has recently come to us. This new machine has several features that are of interest. It has an automatic locking device that prevents the saw from dragging on the return stroke and holds the saw frame at any height when the machine is stopped for setting. An oil dash pot allows the machine to be started
(Continued on p. XX.)

NOW READY

PRINTING

**A Textbook for Printers' Apprentices,
Continuation Classes, and for
General Use in Schools**

By **FRANK S. HENRY**
Instructor in Printing, Philadelphia Trades
School.

MANY a young apprentice passes through difficult experiences in his early work because he has no body of trade facts at his immediate command.

This volume has been compiled especially for the young apprentice and meets the requirements of a practical test which can conveniently be carried in the pocket. As the book has been written for the student who knows nothing of the subject, the author has been especially careful to explain fully the fundamental principles underlying the various processes. The book contains a glossary of 350 terms which will prove of great value to the student.

The following is a list of subjects which are discussed:

Composition-Type, Spaces, and Leads; Composition-Setting Plain Matter; Taking a Proof, Correcting the Job, and Returning Type to Case; Type Calculations; Proofreading; Type Faces; Job Composition; Setting a Job; Setting Tables and Other Intricate Matter; Locking Up Forms; Imposition; Cutting-Tools for Printers; Composing Machines; Presswork; Printing Ink; Paper.

325 pages, 5 $\frac{1}{4}$ x8, 153 figures, Cloth \$1.50 net.

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Copies of any of our books will be sent for free examination, no cash in advance. You have the privilege of returning the books if found unsatisfactory. Kindly mention the institution with which you are connected.

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MONTREAL, CAN.
Reed Publishing Co.

MANILA, P. I.
Philippine Education Co.



Have You a **Starrett** Combination Square?

IT is the one tool that every carpenter and cabinet maker should have. It helps you to do better work and faster work—it can be used as a rule, square, level, bevel, and even as a depth gage, height gage, or marking gage. Isn't that a tool worth having?

Starrett
TRADE MARK
REG. U.S. PAT. OFF.
Tools

Are all accurate and well made—they will help you in laying out and measuring your work. Among the fine tools we make for carpenters you will find rules, squares, steel tapes, scratch gages, cabinet scrapers, nail sets, trammels, compasses, etc. You can see them all at any good hardware store.

Write for free catalog No. 21 E.F., describing the full line and giving prices.

The L. S. Starrett Co.

The World's Greatest
Toolmakers

42-519 Athol, Mass.



FIELD NOTES

YOUR COOPERATION DESIRED

Beginning in November this Magazine will publish a list of the teachers and supervisors of manual arts and vocational subjects who are engaged in the military and naval service of the United States. We shall appreciate the assistance of our readers in securing such names. Please send the home address, the rank and the branch of service with each name.—EDITORS.

(Continued from p. XI.)

remainder until a complete audit of all vocational schools in the cities, with the exception of Milwaukee, has been made. The amount to be released will be nearly \$100,000, which will be used to tide over the vocational schools in 31 cities.

This coming season the evening and continuation school work in Detroit is to be modified to meet the general requirements of the signal corps. New equipment is being placed in the Cass Technical High School for teaching telegraphy and the general principles of signal service wiring.

Amandus L. Jordan, a graduate of Bradley Institute and a teacher of manual training in Cleveland, Ohio, won a first lieutenantcy at Fort Benjamin Harrison this summer, and was one of the five men selected, out of 150, to go to Harvard University to study modern trench warfare under French officers. When this is being written it is expected that he will soon be sent with one of the French officers to the cantonment at Montgomery, Alabama, to give instruction to one section of the new army. Lieutenant Jordan's knowledge of the French language, gained in two years at school, is proving very helpful, as well as his instruction in wood-working, metalworking and drawing and his successful experience in teaching.

E. E. MacNary, director of industrial education in Springfield, Mass., has been called to Washington to take up some training work for

(Continued on p. XV.)



FIELD NOTES

(Continued from p. XIV.)

the Emergency Fleet Corporation. A six months' leave of absence has been granted Mr. MacNary for this work.

James McKinney, of the Ethical Culture School, New York City, is now enjoying his Sabbatical year. He plans to visit various sections of the country studying first-hand some of the newer schemes of manual arts work that are being tried out.

The summer school work in the public schools of Newark, New Jersey, covers a period of six weeks, and employs a corps of 720 teachers, requiring 11 more teachers this year than last. The work given covers all the grades and the high schools.

A thoroly modern high school building has just been completed in Clayton, Mo., at a cost of about \$140,000. In the manual training department are separate rooms for the study and practice of woodworking, mechanics and mechanical drawing, each having modern appliances of nearly every description for use of the students.

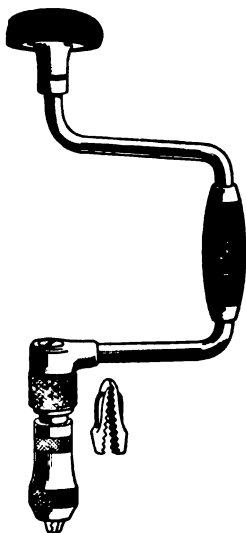
John R. Frazier, formerly of Bradley Institute, has accepted a position as instructor in freehand drawing at the University of Kansas.

Class schedules in the junior high schools of Cleveland, Ohio, have been arranged to provide more time for vocational studies. The additional time allotted for this work will amount to practically one period of 40 minutes each day.

(Continued on p. XVI.)

Are
YOU
SAVING YOUR MONEY
to invest in the
NEXT ISSUE
of the
LIBERTY LOAN
?

Stanley
Tools



STANLEY CONCEALED RATCHET BIT BRACE

The novel features of design, together with the high quality of workmanship and material, place this tool in a class by itself as to strength, durability and convenience of operation.

The Cam Ring, which governs the Ratchet, is in line with the Bit—a great advantage in working. It also serves as a cover or case for the Ratchet mechanism, protecting it from dirt, grit and moisture, and enabling oil for lubrication to be retained for a long time.

This form of construction presents a neat appearance as well as guarding the user's hands perfectly.

For the reasons stated this makes an ideal Brace for Manual Training use.

STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.

VENUS 10¢ PENCIL

If it isn't a
VENUS

it isn't the right
drawing pencil!



Specify **VENUS**
and look for
the distinctive
VENUS finish!
17 degrees from
6B softest to 9H
hardest and hard
and medium
copying.



VENUS *Superfine Quality*
ERASER *Rubs out
Cleanly and
Easily*

**Will not soil or streak. 12 SIZES.
FROM 100 TO BOX, TO 4 TO BOX.**

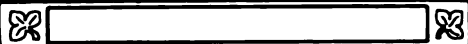
FREE!



← This trial box with
five **VENUS** Drawing
Pencils, Holder, and
VENUS Eraser sent
free!

Write for it today.

American Lead Pencil Company
216 Fifth Avenue Dept. A New York
and Clapton, London, Eng.



FIELD NOTES

(Continued from p. XV.)

The war has produced a scarcity of men for manual training positions. Reports from teachers' training schools announce that they are wholly unable to meet all the demands this fall. The result is that many young students have been employed at salaries above what they would ordinarily receive.

Elmer G. Whitmarsh, a graduate of the Sloyd Training School, Boston, is teaching manual training in Melrose, Mass.

John F. Friese, of St. Cloud, Minn., has accepted a position as manual training instructor at Bonners Ferry, Idaho.

C. B. Gwynn, formerly head of the manual training department in the high school at Olympia, Wash., has been appointed director of the manual arts department of the State Normal School, Cheney, Wash. E. L. Dales, who has taught manual training in the Spokane public schools for the past four years, is assistant director.

Harry Stephenson resigned his position as instructor of manual arts in the Township High School, Murphysboro, Ill., to accept the position of assistant instructor of manual arts in the State Normal School, Ellensburg, Washington.

BASKETRY For Schools and Craft Workers

MATERIALS Reeds, willow, chaircane raffa, Indian ash splints, braided rush and straw—fine, smooth quality—dyes and finishes. Any amount of reeds sold from a half pound up. Also tools and books of instruction. *Send for free catalog, "Everything for Basket Making".*

Louis S. Drake, Inc., 975 Watertown St., West Newton, Mass.

Tools for Sheet Metal Work

Manual training, vocational and technical schools are invited to communicate with us regarding equipment of shops for sheet metal work, the importance of which is constantly increasing, owing to the popularity of sheet metal as a substitute for other materials.

Ask for catalog *M T 50*.

**NIAGARA MACHINE AND TOOL WORKS
BUFFALO, N. Y.**

MANUFACTURERS OF
MACHINERY FOR WORKING SHEET METALS



A Bureau for Specialists

Leading Bureau in America for Teachers of Manual Training and Home Economics. Keep an up-to-date record of your training in our files. - - Send for a new registration blank today

THE SPECIALISTS' EDUCATIONAL BUREAU

ROBERT A. GRANT, Manager Nicholas Bldg., St. Louis, Mo.



THE PRATT TEACHERS' AGENCY 70 FIFTH AVENUE NEW YORK

Recommends college and normal graduates, specialists, and other teachers to colleges, public and private schools. The Agency receives many calls for Manual Training Teachers from both public and private schools. Wm. O. PRATT, Mgr.



TEACHERS' AGENCY

28 E. Jackson Blvd., Chicago

Boston New York Birmingham Denver
Portland Berkeley Los Angeles

To this organization—national in scope—employers and teachers naturally turn in making a survey of the whole educational field for best teachers and teaching opportunities.

NORTHWESTERN TEACHERS' AGENCY

LARGEST IN THE WEST ... BOISE, IDAHO

20 per cent only of 1916 calls filled due to lack of high-class teachers.



WM. RUFFER, Pd. M. A. M., Manager.

One Agency that does the work of Many.
The Largest and Most Widely Patronized Agency in the West. Free Registration.

UNIQUE GEMS UNITED STATES STONES

New and attractive American semi-precious and staple stones priced especially for the encouragement of individual effort among students of Universities, Colleges, Normal, Art, Technical and Manual Training Schools. I am regularly supplying all the important Educational Centers of this country and will send sample memoranda assortment upon request of responsible parties.

Louis J. Deacon

Warrenton, Virginia

Everybody Loves Printing

Ross Spaulbury, Principal of the Indian School, Pine Ridge, South Dakota, has maintained a printing plant there for 19 years, publishing a handsome magazine and doing all grades of work. He says: "The shop is a valuable educational addition to the school; the students like the work immensely; many of the boys do not use English fluently but are quite adept in composition and presswork; there is a marked improvement in their English after spending a time in the shop and their academic work is greatly strengthened; we would not like to think of getting along without the shop." We furnish School Printing Outfits.

Barnhart Brothers & Spindler

Chicago Washington Saint Louis Dallas
Kansas City Omaha Saint Paul Seattle
SET IN PENCRAFT BOLD BORDER NO. 714

Build Your Own Grandfather's Clock with our help

We furnish blue prints, finishing material and instructions. Buy the works, dial, weights and pendulum from us at surprisingly low prices. You make a fine profit building artistic clocks for your friends.

Complete Works \$5.00
Others with chimes at all prices
Ask for attractive Free Offer
CLOCK COMPANY
1646 Ruffner St., Philadelphia, Pa.



Manual Training Sloyd and Stencil

KNIVES



Robt. Murphy's Sons Co.

Mrs. High Grade Cutlery

Est. 1850

AYER, MASS.



Remember the efficient and economical

"JORGENSEN"

when making your specifications for Hand Screws.

Next year your School Board will thank you for doing so—last a lifetime.

ADJUSTABLE CLAMP CO.

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CHICAGO, ILL.

LUFKIN

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STEEL and WOOD RULES—MEASURING TAPES

A COMPLETE HIGH-GRADE LINE
 Stocked by Supply Houses. Specify **LUFKIN**
 Send to us for catalogue.

THE LUFKIN RULE CO.

SAGINAW, MICH.
 New York Office
 No. 106-110 Lafayette Street



Free to Teachers

"Saw Points"

Illustrating and explaining how to Joint, Set and File Saws. This booklet is now being used by a great many manual training teachers as a text book. One copy free to teachers upon application. Additional copies:

5 cents each
 25 cents per 10
 \$2.00 per 100

CHAS. MORRILL
 98 Lafayette St., NEW YORK

ART METALWORK

By Arthur F. Payne
 FOR CRAFTSMAN. TEACHER OR STUDENT



A textbook written by an expert craftsman and experienced teacher. It treats of the various materials and their production, ores, alloys, commercial forms, etc.; of tools and equipments suitable for the work, the inexpensive equipment of the practical craftsman, and of the correlation of art metalwork with design and other school subjects. It describes in detail all the processes involved in making articles ranging from a watch fob to a silver loving-cup. It gives new methods of construction, new finishes, new problems. It is abundantly and beautifully illustrated. The standard book on the subject.

Postpaid, \$2.00

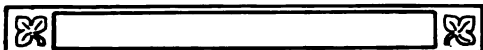
THE MANUAL ARTS PRESS
 PEORIA ILLINOIS

EARN MONEY WHILE ATTENDING SCHOOL

AN exceptional opportunity to earn expense money is offered to one student in every school, by representing this magazine and the book publications of THE MANUAL ARTS PRESS. The work is easy, pleasant and profitable, and requires only spare time. Arrange now before your school is taken.

Write at once giving references to

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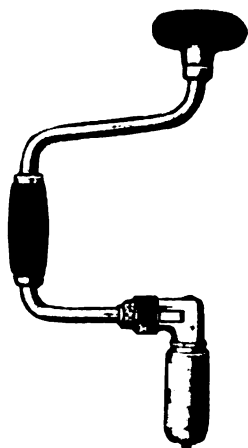
TRADE NOTES

A band saw guard that prevents a boy from putting his hand in the saw or his head against it, at once commends itself to the cautious teacher. These are the distinguishing features of the Midu Saw Guard. In addition, it projects back of the saw blade, thus preventing the operator from striking the back edge of the saw. It is simple, practical and effective, and is so constructed that one can change saws without removing the guard. An illustration of this guard is shown on p. XXI in the advertisement of the Midu Saw Guard, Salina, Kansas.

The Peck, Stow & Wilcox Co. have published a book entitled "The Little Pruning Book" which contains all the essential facts concerning pruning, including when, where and how to prune, and the correct kind of pruning shear to use. It is illustrated with diagrams showing how new growth should be headed back, the medium pruning of strong-growing shoots, pruning of roots, and the even distribution of branches up-and-down and around the trunk. It is free from unnecessary technical terms and will serve the needs of garden and nursery workers as well as agricultural students. The price of the book is 50 cents. Orders should be addressed to Peck, Stow & Wilcox Co., Cleveland, Ohio.

There was a time not so very long ago, when the average catalog was a rather uninteresting piece of printed matter. To-day catalog makers seem to be vying with one another in producing the most attractive catalogs possible. The new catalog of the Oliver Machinery Co., entitled "Woodworking Machinery of Quality," is in the front row of beautiful pieces of printed matter. In the first place, their choice of cover paper is a happy one, and this has been rendered still more attractive by the color design on the first cover page. The paper of the text is a high grade enamel which allows of excellent treatment of the many half-tone illustrations. The catalog contains a complete description of their entire line of woodworking machinery, and the firm is desirous that every supervisor of manual training shall have a copy. A request will bring one.

If any of our readers are not familiar with
(Continued on p. XXI.)



For School Work

You can't beat this brace for all-round school work for it is a thoroughly high-grade mechanic's tool.

MILLERS FALLS BIT BRACE No. 732

has a chuck that will hold round as well as bit stock shanks—a ratchet that's boxed and protected against dust and a head that's ball-bearing to minimize thrust friction.

Mechanic's Handbook containing valuable information never before printed and pocket catalog free on request.

MILLERS FALLS CO.

"Toolmaker to the Master Mechanic"

MILLERS FALLS, MASS.
N. Y. OFFICE, 28 WARREN ST.



GIVING FREE

HUNDREDS OF INSTRUCTOR'S

SHOP APRONS

WITHOUT CHARGE TO TEACHERS OF MANUAL
ARTS WHO PLACE THEIR ORDERS WITH
US FOR STUDENT'S APRONS.

WRITE TODAY FOR PARTICULARS



THESE
APRONS
ARE
USED
IN
MANY
SCHOOLS
ALL
OVER
THE
COUNTRY

THEY
GIVE
MAXIMUM
SERVICE,
AND ARE
MADE
ESPECIALLY
FOR THE
MANUAL
TRAINING
BOY

 Above is cut of our
Instructor's Model
"H"

(Without Student Aprons, 85c.)

OUR STUDENT APRONS

Are made from fine materials. Large roomy
pockets and adjustable neck strap.

SIZE 29" x 36"

PRICE OF WHITE DUCK APRON 50c

PRICE OF BROWN DUCK APRON.....60c

GUARANTEED TO GIVE SATISFACTION

ADDRESS

The
P. C. Goodrick Company
Fond du lac, Wisconsin

NOW READY

PRINTING

**A Textbook for Printers' Apprentices,
Continuation Classes, and for
General Use in Schools**

By **FRANK S. HENRY**

Instructor in Printing, Philadelphia Trades
School

MANY a young apprentice passes
through difficult experiences in
his early work because he has no
body of trade facts at his immediate
command.

This volume has been compiled especially for the young apprentice and meets the requirements of a practical test which can conveniently be carried in the pocket. As the book has been written for the student who knows nothing of the subject, the author has been especially careful to explain fully the fundamental principles underlying the various processes. The book contains a glossary of 350 terms which will prove of great value to the student.

The following is a list of subjects which are discussed:

Composition Type, Spaces, and Leads; Composition-Setting Plain Matter; Taking a Proof, Correcting the Job, and Returning Type to Case; Type Calculations; Proofreading; Type Faces; Job Composition; Setting a Job; Setting Tables and Other Intricate Matter; Locking Up Forms; Imposition; Cutting-Tools for Printers; Composing Machines; Presswork; Printing Ink; Paper.

325 pages, 5 1/4 x 8, 153 figures, Cloth \$1.50 net.

FREE EXAMINATION TO TEACHERS

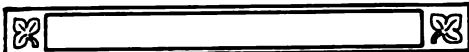
Copies of any of our books will be sent for free examination, no cash in advance. You have the privilege of returning the books if found unsatisfactory. Kindly mention the institution with which you are connected.

JOHN WILEY & SONS, Inc.
432 FOURTH AVENUE, NEW YORK

London: **CHAPMAN & HALL, Ltd.**

MONTREAL, CAN.
Beauchamp Publishing Co.

MANILA, P. I.
Philippine Education Co.



TRADE NOTES.

(Continued from p. XIX.)

the Venus line of lead pencils manufactured by the American Lead Pencil Co., New York City, they should read their offer of a set of trial samples and promptly send for a set. The Venus pencil can be secured in seventeen degrees of hardness, hence it meets every school requirement.

The South Bend Lathe Works, South Bend, Indiana, announce that they have sold over 15,000 lathes. They advertise delivery one week after receipt of order. Their book "How to Run a Lathe" has proven helpful to many shop teachers. A copy of this and also their new catalog No. 50 will be sent on request.

Schools interested in the purchase of a tilting cupola furnace will be glad to know that H. Channon Co. carry a full line. Their advertisement on the second cover page contains an illustration of a furnace. This firm also carries drafting instruments and supplies.

Chas. Morrill, Inc., have put on the market a soap urn which is being used very extensively in schools. It is a glass jar, holding 14 ounces, enough for 700 individual washes, and has a dispensing valve and a lock cover. It is secured to the wall or slab by a bracket. Full information will be furnished to anyone interested.

The advertisement of Barnhart Bros. & Spindler on p. XVII contains a statement of the value of printing as a school subject that bears out the experience of everyone who has had experience with a school print shop. Furthermore, it also stimulates a fine school spirit, and this means much to a school.

It is sometimes difficult to find where the specialties needed for a given project can be found. It took us some time to locate a firm that furnished clock movements to schools. Finally, The Clock Co., 1666 Ruffner St., Philadelphia, came to our notice, and we have been passing this firm's name on to inquirers ever since. Do not hesitate to write to us for similar information along other lines. It is just for this purpose that this Magazine maintains a "Service Department."

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BOOK NOTES

“A MAN will write crudely if his thinking is crude; there is no way in which an engineer can produce, in writing or speaking, the effect of an educated man unless he is an educated man; and if one may take the word of the leaders in the profession, that part of his training which tends to humanize him, to develop him as a man, makes him to just that degree a better engineer.” These significant words are from the introduction to Professor Frank Aydelotte’s “English and Engineering” just published by McGraw-Hill Book Co., New York. The book is a collection of essays by writers of note, classified under the headings: Writing and thinking; the engineering profession; aims of engineering education; pure science and applied: science and literature; literature and life. Selections from Tyndall, Huxley, Carlyle, Ruskin, Emerson, Wordsworth, Arnold, and several more recent writers are represented in the collection. This collection has done for the engineering student what someone should do for the trade school student. To some extent this book may serve both classes of students equally well.

ANOTHER WORKSHOP NOTE-BOOK BY GREENE.

Many readers of this column will be glad to learn that George G. Greene of the Lane Technical High School, author of the *Workshop Notebook* on general woodworking, has written a similar notebook on pattern making which will be published soon by the Manual Arts Press. Mr. Greene has been working on this note-book for the past two years or more; he has been selecting and “boiling down” material on pattern making until he now has a product that contains the fundamentals in convenient form for class use. When put out in the same form as his other notebook and sold at a low price, it is sure to be a great help to many teachers of pattern making. Even if a school board thinks it cannot provide, or require pupils to provide a textbook on pattern making, everyone can afford to use such an inexpensive notebook as will soon be available.

The reviews of Mr. Bennett’s latest book, *The Manual Arts* are beginning to appear. The following is taken from *The Colored Teacher* for September, published at Wilberforce, Ohio.

“At this time, when there is such confusion of aims and methods in the teaching of manual arts, the book by Mr. Bennett is indeed timely and instructive. He urges the use of a greater variety of manual arts in the schools and points out the great value of a varied industrial experience in the modern home as well as in industrial life.

* * * * *

“In the chapter dealing with the selection of subject matter, he points out the common mistakes on the one hand and suggests a remedy on the other. His exposition of the group method of organizing matter for manual arts instruction clears up one of the most perplexing problems with which the teacher of manual arts has to deal. Another valuable chapter deals with the much-talked-of factory system of teaching the industries and clears up another question that instructors of industrial subjects have to face in the matter of shop organization. But best of all is the chapter in which he discusses the various methods of teaching the manual arts. In this chapter the author makes an invaluable contribution to the literature of industrial education that no teacher of industrial subjects can afford to be without.

“The book is easily one of the most helpful ever written on the subject and in several ways represents a distinct advance in the literature on the teaching of the manual arts.”

The *School Arts Magazine* says that it “should be read by every manual arts teacher in the United States,” and that it “is masterly in its grasp, and convincing in its presentation. It answers such questions as What should be taught? Why should it be taught? Should the esthetic element be considered? Should vocational values be considered? How should subject matter be organized? Is the group system the best? Should factory methods prevail in schools? What is the most effective procedure in teaching?”

Among the comments received on *Seat Weaving*, by L. Day Perry, is the following:

“Indeed you are right in regard to calling it an admirable volume on the subject. It is a little gem, and will be exceedingly valuable to every person interested in manual training work. I shall be pleased to bring it to the attention of those who would appreciate it.”

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NOTE: The series of articles on "Related Work" by Egbert E. McNary, begun in
the November number, has been interrupted owing to the fact that Mr. McNary's
time is very fully occupied with his present duties as expert in industrial training
for the United States Shipping Board.

This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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FIELD NOTES

IN MANY manual training shops the month of December is given to work appropriate to the season. The making of toys is carried on to quite an extent and is a form of shop work that carries with it a fine spirit of helpfulness. William Noyes, director of manual training in Duluth, Minnesota, plans to concentrate the efforts of the sixth grade boys who are in shop work on toys put together with cutter pins. The spools turned in by the Red Cross Headquarters are also to be utilized in some way. For toy making in the upper grades he hopes to have "kiddie kars" turned out in quantities. Mr. Noyes has found that the popularity of this sort of work depends largely on the success with which the article can be suitably painted or colored.

In Des Moines, Iowa, Roy C. Woolman gives emphasis to toy mending. The toys of children of the well-to-do families are repaired and then distributed among the less fortunate children of the community.

L. Day Perry, of Joliet, Illinois, gives expression to the Christmas spirit thru the print shop. Each boy in the print shop is given a number of two-color Christmas cards which he has had a part in getting out. Also, as in most other places, regular problems are permitted to go out as Christmas gifts.

IN AND ABOUT BOSTON.

Thru the courtesy of Principal Williston, the Boston Manual Training Club held on Saturday, October 20, its first meeting of the season in Wentworth Institute. As the men arrived, from 11:00 to 12:30, they inspected the shops of the school under the guidance of the different instructors who informally gave facts of interest regarding the work of the school. Soon after 12:30 the members and their friends, numbering about ninety in all, assembled in one of the classrooms where an unusually fine luncheon was served. Following the enjoyable period of eating and good fellowship, the men repaired to the hall for the more serious business of the day.

Owing to the number of speakers, the Business Meeting was made as brief as possible and some

of the committee reports were postponed to a future meeting. The officers for the coming year were installed as follows:

Edward C. Emerson, President
George M. Morris, Vice-President
Andrew J. Leahy, Secretary
George F. Hatch, Treasurer
James C. Clarke, Librarian

Three new active and one new sustaining member were elected to membership. George C. Greener, chairman of the Program Committee, outlined plans for the future, which gave promise of interesting meetings to come.

The speaking program of the day was military in character. Several of the prominent instructors of the Institute told of their work in connection with training Army Engineers during the past summer. As this work was briefly described in the September issue of *The Manual Training Magazine*, it will not be necessary here to more than mention the most important points emphasized by the speakers.

Principal Arthur L. Williston gave a cordial welcome to the men as a club and as individuals. He referred to the interests of the men present in promoting a craftsmanship of high quality as identical with the aims of Wentworth Institute. He then briefly ran over the work of the summer and told how the historic First Corps Cadets qualified as an engineer regiment. Starting in May with about 350 in the evening classes, the Institute gave special courses adaptable to military demands. Later, the instruction of the Institute was carried on during the day time, as a part of the regular training. New recruits from various fields of industrial and engineering pursuits joined the corps till September 24 when about 1,700 sturdy and intelligent young men, who now form the 101st regiment for Engineers, broke up camp at the Wentworth Institute grounds. Mr. Williston talked from slides showing the men studying machines, welding with the acetylene flame, at concrete work, in the electrical laboratory, drafting, constructing bridges in the yard, testing strength of materials, operating power plant, etc. Slides of men working in the trenches at Fresh Pond were also shown.

(Continued on p. VI.)

FIELD NOTES—(Continued from p. V.)

Samuel L. Conner, professor of civil engineering at Tufts College, spoke about his military surveying course to the cadets, and showed samples of the pace scales, slope boards, and compasses used, as well as blueprints of surveys made by the men. Professor Conner recommends a similar course for college students who may be called into service. He also favors a similar course for colleges in general because of the concentration of mind it requires, the exercise it gives to the observation faculties, and the healthy interest it arouses in outdoor life.

John A. Mickelson, instructor in woodworking at Wentworth, spoke on timber construction, as applied to military uses, and illustrated his remarks by sketches on the blackboard. He emphasized the necessity of organizing the work of many men on one job so that the details of the construction shall be ready in the order in which they are needed for assembling.

Walter C. Voss, instructor in architectural construction at Wentworth, talked about the use of concrete in military work. He referred to the two systems, monolithic and unit, and gave examples of their applications. He told of the method used in making military roads of mixing the cement and aggregate dry, placing it in position and wetting down. This gives a road good for five months which in many cases is long enough to supply a military need.

Milton J. Kirkland, of the Association of Portland Cement Manufacturers, Chicago, who is giving instruction to students at the Wentworth Institute, told of his readiness to be of service in connection with any school work in concrete, and offered to give free demonstrations to any group of manual training teachers who might wish to call on him.

Principal Williston spoke again, this time on the question of the use of technical schools in war work. The schools are becoming more and more a factor in the struggle and can aid in training men for industrial work by giving practical instruction. The shipbuilding needs were touched upon and the reconstruction work, where maimed men are among us, was spoken of as a place where the manual training men could be of great service. He advised getting started and taking advantage of every opportunity to

contribute toward developing the man power of the nation.

Charles R. Allen, of the Massachusetts State Board of Education, was to speak; but owing to his new duties as Expert in Industrial Education Attached to Conscription Department, U. S. Shipping Board, he was unable to be present.

Harry H. Tukey, trade instructor, Boston Continuation School, spoke in Mr. Allen's absence of the work of the Charlestown Navy Yard shops. He showed blueprints of the products for which there is a demand, some of which might be made in the manual training schools. A few of these objects are: keyboards, sail maker's benches, chests, tent poles, tent pins, lead line reels, signal boxes, hammock clues, hammock stays, boat and deck chests and sheet metal tool boxes. Mr. Tukey was not sure the manual training men could get orders for these items, but suggested that attempts be made, thru the proper authorities, to submit samples and give estimates of cost.

President Emerson made valuable suggestions as to how the Club could assist in war work by acting as a clearing house for those schools in New England which are in a position to supply any war needs. In the discussion that followed the question of how much the schools could afford to sacrifice their educational methods in turning out products in quantities was given careful consideration. While at present the opportunities for making any material contributions to the War Department are somewhat indefinite, this meeting was rich in suggestions which promise results in the near future.

Ernest W. Beck, Director of Manual Training, Nashua, N. H., has been contributing to the war cause by having his boys make a pattern of the Liberty Bell from which a brass cast was made. The boys in the machine shop finished the bell on the lathe, and the boy in the wood-working mounted the bell on a shield. The room in the high school having the highest percentage of pupils purchasing Liberty Bonds received the bell in recognition of the service. There was great enthusiasm in the contest and the bell is an ornamental piece of work which will serve as a fitting memorial to the school's part in the Liberty Bond drive.

(Continued on p. VIII.)

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FIELD NOTES—(Continued from p. VI.)

The boys in the Nashua grammar schools have made many toys, tricks, and games for the Christmas bag to be sent by the Domestic Science Department to the soldiers. In making the games and toys in the shops, jigs have been used, so that the boys have been able to appreciate some of the methods used in factory production.

Hugh J. Cox, formerly Instructor in a Boston Prevocational School, has recently been promoted to the position of shop foreman in the sheet metal work at the Boston Trade School.

In the elementary grades of the Boston Schools many articles for the soldiers have been made, such as dominoes, domino cases, checker boards, checkers and chessmen, joke cards, tangrams, picture puzzles, etc. The chessmen were printed on heavy card in a prevocational printing shop, and then by an ingenious device designed by Mr. Fisher, of the Quincy Prevocational Machine Shop, the chessmen were stamped out in large quantities. Using them with the plain side up they serve as checkers, and when reversed, as chessmen.

Miss Florence Bean, Assistant in Manual Arts in charge of the fourth and fifth grade handwork for boys, deserves great credit for the success of this work of making gifts for soldiers, as she is largely responsible for the original designs and the organization which has made it possible for the schools to contribute through the Red Cross so many objects which cannot help making the life of a soldier easier and pleasanter.

Each object is labeled with the name of the boy who made it, and the school.

—GEORGE M. MORRIS.

NEWS FROM THE NORTHWEST.

The Manual Arts Section of the Washington State Teachers' Association held a meeting in Tacoma, October 26, in connection with the annual meeting of the state association. Matters of general interest were discussed and the following officers for the coming year were elected: President, Edward G. Anderson, Seattle; Secretary-Treasurer, J. S. Lane, Snohomish.

The Tacoma teachers were hosts on an auto

trip to Camp Lewis, American Lake, where 40,000 men of the new National Army are receiving their military training. This trip was followed by a dinner in the Stadium High School. Plans are on foot to call a meeting in Seattle after the Christmas holidays. The manual arts men of the northwest feel the need of closer cooperation and a better understanding of the work that is being done in this section of the country.

The summary of a questionnaire recently sent to the high schools in the State of Washington brings out some interesting information. It is based upon replies from 117 accredited high schools that teach manual training.

The total manual training enrollment in these schools is 5,951. In benchwork in wood there were 4,590; in mechanical drawing, 4,113; in forge work, 143, but in only 18 schools; in foundry work, 66 in 3 schools; machine shop practice in 5 schools, but number of students not given; pattern making, 68 students in seven schools; arts and crafts, 12 students in two schools.

Five hours per week is the average time given to manual training in all schools. The average for mechanical drawing in the 85 schools reporting, is $3\frac{3}{4}$ hours per week. The time devoted to woodworking is approximately the same as for drawing. The average for forge work is six hours per week.

Of 117 schools, 39 have circular saws having an average value of \$259 (most of these as the value indicates are combination machines); 40 schools have 161 speed lathes worth \$80 each; 25 have bandsaws worth \$120 each; 28 schools have additional machinery, having an average value per school of \$320.

In 44 schools the students generally use the machinery; in 17 they do not.

In 117 schools, the total value of tools and benches is \$49,904. This is an average per school of \$425, or \$8.40 per enrolled pupil.

Sixty-seven school shops are located on the first floor, 38 in the basement, and three on the second floor; 101 are well lighted and 16 are not; electric power is used in 43 shops, gas in six and water in one; 67 shops have no power machinery.

(Continued on p. X.)

Vol. XIX

NOVEMBER, 1917

No. 3

MANUAL TRAINING MAGAZINE

DEVOTED TO THE
MANUAL ARTS IN
✧ VOCATIONAL ✧
AND GENERAL
EDUCATION ✧ ✧

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FIELD NOTES—(Continued from p. VIII.)

In 44 schools 1,160 textbooks are used. In 60 schools no texts are used in manual training.

Woodworking in 27 schools is taught in the ninth and 10th grades; seven teach it in the ninth, 10th and 11th, four give it also in the eighth; eight in the seventh; 15 in the sixth; and 10 in the fifth.

Mechanical drawing in 19 schools is given in the ninth and 10th grades; in seven the ninth to 11th; in 32 the ninth to 12th; in addition, four give it in the eighth, 31 in the seventh, five in the sixth and three in the fifth.

In 69 schools, student drawings are made the basis of the shop practice. Seven schools use them somewhat and 12 not at all.

After an inspection tour of the states under his jurisdiction, Ben W. Johnson, regional director of the Smith-Hughes act for the Pacific section, reports that California is far in advance of any other Pacific state in making provisions to receive the benefits of the new act. This is due to the fact that it already had a vocational commissioner and a state organization, which permitted of rapid action. Other states, however, have displayed eagerness to meet the Government provisions.

F. C. Vincent, supervisor at Bellingham, Washington, reports that he has organized new courses in machine shop practice, forging, foundry, sheet metal and automobile construction and repair. The work is in charge of J. E. Moore, who came to Bellingham from El Paso, Texas. Several students are also doing advanced work in architecture, one of the local architects acting as instructor. The plan followed in Bellingham is to require one semester of benchwork in wood, one in pattern making, one in foundry and forging. The automobile work is reserved for the senior year. Two forty-five minute periods each day are devoted to shopwork and one period of equal length to mechanical drawing.

The Bellingham shops are "doing their bit" by working for the Red Cross, making packing boxes, knitting needles and similar work. There has been a shortage of knitting needles on the Pacific Coast. In some places Chinese chop sticks have been pointed and smoothed up, but have not been highly successful. Mr. Vincent uses $\frac{3}{8}$ " birch dowel cut to proper length and

pointed in a pencil sharpener. The knob on the end is obtained by dipping the stick in sealing wax or by wrapping a rubber band tightly around it. These make very satisfactory needles at small expense.

Two new prevocational centers have been opened in Tacoma, this year, making four in all. In these centers the children are given one and one-half hours daily in the shop. Charles T. Miller, director of the work, has plans whereby 50 per cent of the boys and girls of Tacoma will be devoting this amount of time to handwork before another year passes. He is also making every effort to have the shopwork of the high schools largely vocational in character.

—EDWARD G. ANDERSON.

DETROIT MANUAL TRAINING CLUB.

The annual "Come-Together" meeting of the Detroit Manual Training Club was held at the Board of Commerce on October 27th at 12:30. An excellent dinner was served and the Club listened to some very good music and speakers.

The program for the year as prepared by the Executive Committee was presented to the Club. The two special numbers on this program were: "Leonardo da Vinci as a Constructive Genius," by Ralph Collamore, consulting engineer, and "The Functions of An Up-to-date System of Manual Training," by Superintendent Chadsey.

A plan has been inaugurated whereby the Club will be a clearing house for helpful ideas and suggestions thru the medium of "The Manual Arts Exchange." Each member is requested to make at least one contribution that will be either of general interest to all or of special interest to those engaged in teaching the same kind of shopwork or drawing. A committee will collect these contributions and have them printed on standard size typewriting paper. These will be distributed at the meetings thruout the year, thus enabling each one to build up a loose-leaf notebook of helpful material.

A number of new men hired for work in the department this year were unable to report for duty because of war service. These men have been given membership in the Club and will be advised thruout the year of the work of the de-

(Continued on p. XIV.)

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MANUAL TRAINING MAGAZINE

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FIELD NOTES

MICHAEL W. Murray, director of vocational education in the public schools of Newton, Mass., and Wilson H. Henderson, head of the Milwaukee branch of the extension division of the University of Wisconsin, have been given the commission of major in the United States Army and given the important work of outlining courses for disabled soldiers.

Obviously the plans of the Government are not fully formulated at present, but it is understood that it is the intention of the army authorities to establish a system of re-education and rehabilitation of crippled and blinded soldiers adapted from the French system as developed by Doctor Amar. The whole problem of dealing with the physically disabled is tremendously important. It is connected with the questions of pensions, insurance, surgery, psychology, employment, placement and vocational training. We have so long been accustomed to seeing on our street corners the cripples who sell pencils; to attending sales of work by blind people which we buy out of pity; to paying pensions for disabled soldiers—in fact to thinking that the physically disabled are far removed from a normal economic and vocational status, that it will be difficult for us to even imagine a system whereby the crippled soldier is taken from the battle field and thru a careful system of surgical attendance, beside occupational work, vocational training and vocational placement, re-made physically, mentally and psychologically into a useful citizen capable and able to take care of himself.

CHANGES TAKING PLACE IN BOSTON.

Aside from the activities for the Red Cross as suggested in my report of last month, the School Department has not succeeded in doing any constructive work of a military nature. There is as we all know a great demand for industrial workers and every reason why the schools should contribute very materially toward preparing young men for meeting this demand. The effect of the war is felt principally in the reduction of numbers of boys over fourteen years of age in the upper grades of the elementary school and in the entering class of the high schools. The

reason for this is that boys are employed at exceptionally good wages, and do not feel the importance of the work of the schools.

Regarding new lines of work there have been two new cooperative courses in high schools established this fall, one in woodwork at the Brighton High School under Clarence W. Goodridge, formerly a prevocational instructor; the other in electricity at the Charlestown High School, under Maurice J. Moriarty, also a former prevocational instructor. This makes four high schools in Boston that are conducting part-time courses, the other two being Hyde Park High, metalwork, and Dorchester High, woodwork.

A junior high school, or intermediate school as the authorities here choose to call it, has been organized in six of the elementary schools. The shop organization has not been completely carried out in any case, owing to the lack of school building accommodations. There are a number of new buildings under construction, in which we shall have a group of three or four shops with as many activities, particularly designed to meet the needs of the different types of boys. Some will receive a limited experience, and those who have a particular industrial bent will have the opportunity of intensive work with possibly ten periods a week in the shop subjects. The prevocational schools will thus come under the junior high school organization.

At present there is one case where some boys of the ninth grade receive four hours a week of shopwork in a high school under a high school shop instructor. In another case we have increased the time from two to four hours with chosen groups of boys in the seventh and eighth grades, and are conducting experimental lines of work involving woodwork, electrical construction, and concrete form-making and casting. While the change in the system, owing to the intermediate school, may result in reducing the minimum amount of time for manual training for those boys who are academically inclined, it will no doubt result in an increase in the time for various forms of shopwork for those boys who are likely to enter the industries.

There is an addition being built to the Hyde Park High School, in which plans are made for

(Continued on p. VI.)

extending the woodwork and metalwork now being carried on in limited quarters.

The Boston Trade School for Boys has this fall moved into its new building on Parker St., across the street from Wentworth Institute. This building has accommodations for over 300 boys at present, and with the addition of another wing, which has been planned for to meet the growth in numbers, it will accommodate about 1,000. The school is primarily for those boys over 14 years of age who have decided upon an industrial career. The courses are conducted by men from the trades, and with a view of supplying to the boy what he would previously have been given by the apprenticeship system. The correlation of academic and shop subjects is very strong. While the school has the name and aim of a trade school, its courses are broad and give to the boy much that is found in the more liberal type of school.

For two years the High School of Commerce has offered to its boys instruction in drawing as related to commercial work, under Ludwig Frank, formerly of the Department of Manual Arts. In addition to his school work, Mr. Frank has recently become connected with the F. A. Foster Company of Boston, as a designer of art draperies.

The 101st Regiment of United States Engineers broke camp at Wentworth Institute late in September. As has been noted in other issues of this Magazine, the training the young soldiers received was of a high order, and intensely practical. They may by this time be "somewhere in France."

The program arranged for Potato Day at Franklin Park, Saturday, October 6, when the children of the public schools were to gather their many bushels of potatoes, was postponed because of the very wet condition of the ground. These exercises will, no doubt, come off either Friday or Saturday of the following week.

In Lowell, Mass., war conditions have created demands for boys who have had experience in manual training shopwork. Last spring, the superintendent of a large machine shop hired forty boys from the high school and paid them from ten to sixteen dollars a week. The work

involved pattern-making, machine shop and foundry work, and assembling. A number of the boys failed to return, owing to money inducements. Yet, on the other hand, many did return, realizing the value of their school work in preparing them for greater responsibilities.

The Lowell High School and the Vocational School cooperate in the making of machines, such as lathes, and gas engines. The patterns are made in the high school, while the castings are finished and the machines are assembled in the Vocational School. This gives to the boys of both schools practical work in which they can see direct results.

The Milton, Mass., High School has been moved over to the Vose Elementary School, and the former high school will house in the future the pupils from the Vose School. Extensive additions have been made to the Vose School, in order that the industrial arts subjects may have proper accommodations. There will be two rooms equipped for woodwork, one room for wood-turning, and one for machine woodwork. The rooms for the domestic arts for the girls have received careful attention. The cooking appliances are the very latest design, and the whole equipment exemplifies the possibilities of modern facilities.

In the manual training department of the Lynn English High School over 100 pupils are pursuing courses in printing under the able teaching of Leslie S. Burnell. It is expected that a class of 10 or 12 will be developed from this number to continue the subject of printing for four years, and at the end of their course be placed with master printers of Essex County to finish their apprenticeship training.

This course has the approval of the Master Printers and the advice and counsel of a committee appointed by them. The school equipment is quite up-to-date and the product is used entirely by the school department.

R. W. Watts, formerly mechanical instructor at the Attleboro, Mass., High School, has accepted the position of instructor in mechanical drafting at the Lynn English High School.

—GEORGE M. MORRIS.

(Continued on p. VIII.)

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IN THE NORTHWEST.

The Manual Arts Club of Seattle held a farewell banquet for Ben W. Johnson, Monday, Sept. 24th., prior to his departure for Washington to enter upon his new duties as field agent under the Federal Board for Vocational Education. Harry Cunningham, of the Lincoln High School, acted as toastmaster and he called on the following to respond: Frank B. Cooper, superintendent of schools, Miss Clara P. Reynolds, supervisor of high school art and design, H. W. Mulhollan, head of the manual arts department of the Broadway High School, Miss Elizabeth Mahoney, the oldest manual arts teacher in point of service in Seattle, F. W. Cobb, Wm. O. Fletcher, and Mr. Johnson, who spoke concerning his new duties. Mr. Fletcher, in behalf of the club members presented their former chief with a Corona typewriter standard enclosed in a handsome leather traveling bag.

In Seattle a comparative study has recently been made of salaries of manual training and industrial teachers in ten cities with the following results:

	Min.	Max.	Increase per year
Seattle	\$1,080	\$1,440	\$ 60
Los Angeles	1,200	1,775*	
Detroit	900	1,500	100
Sacramento	1,200	1,620	105
Cleveland	900	1,500	100
St. Louis	1,200	1,600	100
Oakland	1,200	1,500	100
Portland		1,400	
San Francisco	1,080	1,320	
Cincinnati	1,000	1,500	100
Pittsburg	1,000	1,500	100
Buffalo	900	1,500	100

*Maximum after 10 years.

James B. Mitchell of Tacoma has resigned his position as supervisor of the manual training in the grades to become a lieutenant in the Quartermaster's department of the Army. Mr. Miller, formerly head of the high school work in manual arts in that city, has been promoted to the supervision of all the manual training in the city schools of Tacoma.—EDWARD G. ANDERSON.

ACTIVITY IN ST. PAUL.

The following is quoted from a letter recently received from Donald V. Ferguson, supervisor of manual arts in St. Paul, Minn. It shows great activity in that busy northern city:

"The only appreciable effect upon this department which the war has caused so far, is that it has made it extremely hard to get patternmakers and machinists for the positions in the schools, as the demand is so very great for them in the war industries that we cannot keep them.

"We are making fruit and vegetable driers and racks for use in the cold-pack work in connection with the movement for food preservation, and it is possible that considerable of this work will be put into the regular course for the spring term in order to supply the housewives with them during the fruit season.

"St. Paul passed a bond issue for \$3,000,000 for new school buildings and sites, and it is the plan of the department to build several intermediate or junior high schools together with a technical high school within the next few years. Plans are already under way for the first three of these buildings; when completed, the industrial work will receive a very great addition to its present working equipment.

"St. Paul will attempt to take advantage of the money appropriated by the Smith-Hughes Bill and keep the department as a whole well within the requirements as set by this act. We are attempting to make the grade work prevocational.

"The garden movement in St. Paul received a very wonderful impetus thru the bird house exhibit and Garden Club meeting which we held a year ago, and this year thousands of gardens with their bird houses were in evidence throughout St. Paul.

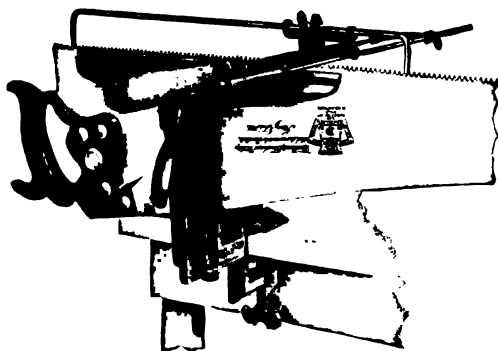
"Much trouble was had with potato bugs, etc., until the birds got busy, and as a result the gardens came thru finely and we are going to help Uncle Sam next year by producing larger gardens and protecting the crops with birds thru the medium of the bird house and bird bath, etc.

"St. Paul is the grandest city in the world in the spring of the year and we are going to welcome the Western Drawing and Manual Training Association with open arms, and every mem-

(Continued on p. X.)

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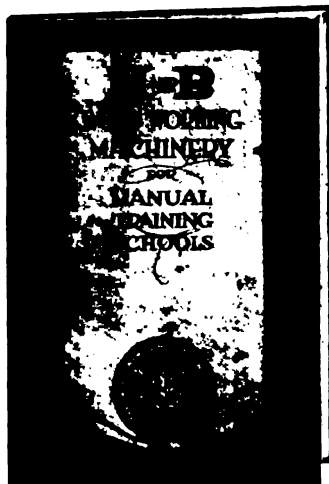
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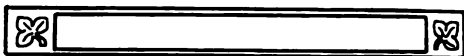
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FIELD NOTES—(Continued from p. VIII.)

ber who avails himself or herself of the opportunity of visiting us when the next meeting is held here will feel wonderfully well repaid for doing so."

INDUSTRIAL ARTS ROUND TABLE.

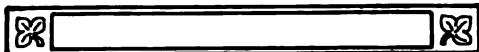
The Industrial Arts Round Table Club of Chicago and vicinity, held its first meeting of the year at the Stevens building, Chicago, October 5th. After a very fine dinner, L. W. Wahlstrom, the president, opened the discussion of the evening with a short address outlining plans and some possibilities for the club during the coming year. The same plan as was used last year, that of free informal discussions of subjects pertaining to industrial arts work, will be carried out. However, in order to encourage some study on a subject the program committee will announce the subject for discussion and appoint a leader for each meeting in advance.

The topic for consideration at this meeting was architectural drawing in high schools. E. L. Valentine, of Lane Technical School, was the leader. He exhibited a very fine collection of slides pertaining to the subject and much interest was taken in the subject by the members present.

The next meeting will be held on Saturday, November 10th, at Pullman. We plan to spend the forenoon visiting the Pullman Car Shops and afterwards spend a few hours at the Pullman Free Manual Training School with A. P. Laughlin as our host. We are looking forward to a splendid meeting at Pullman, making of it a real study class, with plenty of questions to discuss—a real round table.—O. M. MERRIMAN.

Johnson School, the educational institution endowed thru the terms of the will of O. S. Johnson, Scranton, Pa., was opened on October 1. It is a co-educational school in which vocational training will be stressed. Robert B. Keller, for many years apprentice instructor for the D. L. & W. R. R. Co., is the principal. He visited all the principal vocational schools of the country and also made a study of local conditions in order to make the school meet local requirements. It will have day and evening courses which have been arranged after conferences with employers, especially the railroad and mining corporations and the silk mill owners.

(Continued on p. XI.)



FIELD NOTES—(Continued from p. X.)

A school patterned after the famous Eton School of England is to be opened in September 1918. It is to be known as the Silver Bay Winter School for Boys and will be located on the shores of Lake George, New York. The plans for the school are being developed by the Silver Bay Association under the leadership of C. C. Michener, president of the Association. It will be a college preparatory school, and will in addition prepare boys who cannot go to college for a man's part in the world. Entrance requirements will be very high as to character, athletic ability and ability as a student.

As a war measure, classes in telegraphy have been organized in the Prevocational School, Louisville, Ky., for the purpose of training young men for the Army Signal Corps. The apparatus for this work was furnished by the War Department.

Under the direction of Superintendent O. L. Reid the schools of Louisville are endeavoring to meet the needs of the times as far as possible. A new night school has been organized for colored people in which in addition to the regular academic work courses are offered in woodworking, moulding, forging, and automobile work. Also a beginning has been made in the boys' and girls' high schools and at the Prevocational School for part-time classes.

In the schools of San Francisco where only an hour and a half a week is given to manual training work, Charles L. Jacobs, supervisor, has decided that their best service to the Government at this time can be rendered by giving the pupils as much general information concerning the various important materials of construction as the limitations of a single laboratory, originally planned for woodwork only, will permit. The manual training work is given only in the seventh and eighth grades.

Along with the increased demand for workers in industry has come increased opportunity for service in the department of vocational guidance of the Boston public schools. It has brought about also better cooperation on the part of employers. Although the demand upon the department is 50% greater than it can supply, the workers it does supply usually can be selected with greater regard to individual fitness.

(Continued on p. XIV.)



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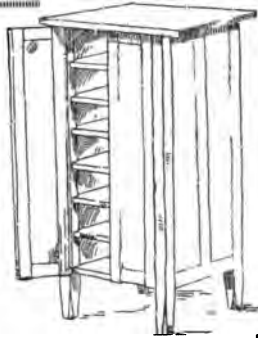
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FIELD NOTES

(Continued from p. XXI.)

Wm. A. Brock, a graduate of Stevens Trade School, Lancaster, Pa., and recently connected with the National Junior Republic at Annapolis Junction, Maryland, has been appointed to fill the vacancy caused by the resignation of William B. Courtney in Trenton, New Jersey.

George W. Buck, formerly of the State Trade School at Bridgeport, Conn., has been chosen director of the new \$40,000 trade school which is to be erected in Danbury, Connecticut.

Professor William H. Varnum has been appointed acting chairman of the department of manual arts at the University of Wisconsin, during the absence of Professor Fred D. Crawshaw.

The Ensley High School at Birmingham, Alabama, is to be equipped at once for foundry work.

A class in jewelry manufacture has been established in one of the vocational schools of New York City. The total cost is to be paid by the jewelry trade. The classroom equipment will cost \$2,000 or \$3,000, and this is to be given to the Board of Education by these same business men. The committee that has worked out the plan to completion is composed of the leading men in the jewelry manufacturing trade in New York City.

In Grand Rapids, Michigan, the evening class registration for machine shop and forging was so great that it presented a serious problem to those in charge. As a solution, the evening-school year was divided into three terms; a course in blueprint reading and mechanical drawing was added and the students were then given one term in each line of work.

Another instance of the increased interest in mechanical subjects among evening school students is shown in Haverhill, Massachusetts. Whereas, in previous years it has been a question whether to continue the mechanical drawing class because of the small attendance, this year 28 were enrolled the first night.

(Continued on p. XXIII.)

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Los Angeles, California:

Howard D. Allen, Signal Corps, studying for Aviation Section;
Clarence S. Cronkite, second lieutenant, Officers' Reserve Corps;
H. L. Detrick, captain Engineering Corps;
Charles L. Mead, private, California Field Artillery;
Harry Craig, National Army;
Mylo Barter, National Army;
Primus Kunou, sergeant, first class, U. S. Army.

Chicago, Illinois:

Frank Culhane, carpenters mate, first class, Grant Park Naval Camp;
Harry P. McHale, capenters mate, second class, Grant Park Naval Camp;
B. O. Lofgren, carpenters mate, third class, Great Lakes Naval Station.

Detroit, Michigan: (rank and branch of service not known.)

Norman Arthur, William Bolt, Verne Fryklund, Perry F. Gifford, George Guy, R. Willis Horn, Clinton Morgan, Donald McGuire, Ralph E. Nyhus, Chat A. Pickins, Paul Thompson, John White.

Newark, New Jersey: (rank and branch of service not known.)

George D. Cronin, Oscar F. Raab, George Frank.

South Orange, New Jersey:

William Harris Merriman, master motor sergeant, Motor Truck Group, American Expeditionary Force, France.

Stockton, California:

H. B. Lenz, American Lake; H. A. Campion, American Lake.

Columbia, Missouri:

Marshall H. Brigham, Co. M, 356 Infantry, Camp Funston, Kansas.

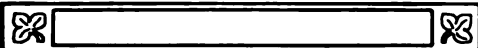
Wellington, Kansas:

R. Greenway, sergeant, Co. L, 139th Infantry, Fort Sill, Oklahoma.

Some of the teachers of manual training enlisting in the Army and Navy have quickly won recognition because of their special technical training. William Harris Merriman, of South Orange, N. J., enlisted in the Quartermasters Corps and is now Master Motor Sergeant in the Motor Truck Group attached to the American expeditionary force. Sergeant Merriman is an electrical engineering graduate of Mechanics Institute, Rochester, N. Y., and received his B. S. degree at Columbia University in 1914.

Another instructor in manual training who is rendering valuable service to the Government is L. A. Tuggle of Danville, Illinois. Mr. Tuggle, as Captain of Company E, 5th Illinois Infantry, Hillsboro, Ill., was called into Federal Service on March 26, 1917. The first duty his Company performed was the guarding of bridges at Cairo and Thebes, Illinois, until August 1. On August 15, his Company was selected as advance detachment to go to Camp Logan and prepare the camp for occupancy. On the fifth day after their arrival occurred the Houston riot in which 150 negro soldiers of the 24th Infantry, U. S. A., mutinied. Captain Tuggle had charge of the Illinois troops that quelled and captured the mutinous troops, and the press of the city accorded him high praise for the soldierly manner in which it was done. Within five minutes after he was notified of the outbreak he had 300 men moving toward the scene of the trouble, and had established martial law an hour before the Governor of the State ordered it. Under circumstances that were a severe test, he was described by one who saw the battle as "the very embodiment of courage, initiative, calm judgment and intelligent efficiency."

Later the commanding general sent Captain Tuggle to the School of Musketry for 30 days training in up-to-the-minute art of modern warfare for the purpose of using him as an instructor for the Division, numbering 26,000 men. This is a very high honor, and has indeed been won.



TRADE NOTES

Every time we are introduced to one of the up-to-date woodworking machines we cannot help comparing it with the crude inaccurate woodworking machines of twenty-five years ago. Take a boring machine, for example, we recall one of the rattle-trap sort, the first we ever tried to use. Compare this with the Oliver No. 74 Universal Vertical and Horizontal Wood Boring Machine, which is built like a machine tool, bores both horizontal and vertical holes, has a graduated tilting table, and may be installed either with a countershaft or a motor drive. It can be used to drill holes in metal and it can be made to do the work of a router, shaper, buzz planer or sanding machine. Both vertical and horizontal spindles are very heavy mounted in ball bearings and can be fitted to carry a three-jawed chuck, an innumerable variety of bits, fly cutters, special cutters, little pattern makers, etc.

We have surely made progress in a quarter-century.

The interest that manual training teachers have been taking in concrete work the past three or four years has called forth a book written for their special needs, by H. Colin Campbell and Walter F. Beyer. It is entitled "Practical Concrete Work for the School and Home" and is published by the authors. It contains just the information that a worker in this medium ought to have, and manual training teachers desiring to introduce this work in their schools will find the book very helpful. Copies can be secured of The Manual Arts Press at the list price, \$1.50.

Little chucks, big chucks, drill chucks, lathe chucks, independent chucks, universal chucks, two-jawed chucks, three-jawed chucks, four-jawed chucks, and all of them made by Skinner. This is the impression one gets from a little poster just sent out by the Skinner Chuck Co., New Britain, Connecticut, inviting us all to send for their new illustrated catalog.

The Prang Company, Chicago, Illinois, have placed on the market a new pen for lettering known as the "Spoonbill" pen. An illustration of the pen is shown in their advertisement on page XXIII. An assorted box of one dozen in three sizes will be sent postpaid for forty cents.



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BOOK NOTES

The September number of *The American Architect* was devoted to vocational and trade schools. It contains one article on "Vocational Schools" by James O. Betelle, one on "The Architect and the School" by J. J. Donoran, and one on "Vocational School Lighting" by F. Laurent Godinez. All of these are illustrated. The first two make use of photographs or plans or both from a large number of schools, including the Boys' Trade School, Boston, the Trade School for Girls, New York City, the proposed high school for Santa Barbara, California, the Vocational School for Boys, Newark, New Jersey, the Technical High School, Oakland, California, the Industrial Arts School, Davenport, Iowa, and others. This number is especially valuable to anyone who is planning a new building.

"Experimental Study of Motor Abilities of Children in Primary Grades" is the subject of No. 2 of a new publication, *Studies in Education*, issued by The Johns Hopkins University, Baltimore, Maryland

In announcing a new Educational Department, Doubleday, Page & Co. are anticipating many changes in the textbooks which will have to come as the result of the War. They believe that many books will be out-of-date when the War closes and they are preparing to meet the new need.

The following is from a letter, received a few days ago:

"We have just finished work in mechanical drawing in the seventh and eighth grades. For this course we have used Bennett's *Grammar Grade Problems*.

Results have been far ahead of our expectations both in quality and quantity of work accomplished. The work is so presented that it develops an intelligent workman."

The following review of *Woodwork for Secondary Schools*, by Ira S. Griffith, is translated from *L'Education*, the quarterly journal of home and school education published at 108 Boulevard Saint Germain, Paris. It appeared in the September, 1917, number.

The teaching of handwork by means of a book makes many exacting demands. It demands a presentation of the object so close that many despair of accomplishing it. This difficulty, which is indeed very great, may be overcome only by the aid of innumerable illustrations. Of these

the book before us contains about 600. The skill with which they have been classified and arranged compels admiration. Photography has been employed only in the less complicated cases. More often the author uses a line drawing, the accuracy of which is unrivalled. The position of the hands, the manner of holding the tool, and the various processes of handling the material are all graphically explained, and by this means the text achieves remarkable clearness. The various qualities of the woods used, the tools, the machines which assist in the work, methods of assembling, wood-turning, wood-carving, finishing, furniture-construction, and pattern-making are all set forth in a complete and practical presentation.

The *Journal of Education*, Boston, recently published a review of *The Manual Arts*, by Charles A. Bennett, which closed with the following paragraph:

"This book presents the essential guide-posts of industrial education. Principals of schools will find in it a solution of some of their serious difficulties. The student of education will find no better-balanced suggestions for the analysis of manual arts subject-matter and for the organization of courses in manual arts for either vocational training or for general education. The book contains questions on each chapter which bring out the vital points."

A review of the same book in the *Sierra Educational News* for October ends as follows:

"Under such titles as Which of the Manual Arts Shall be Taught in the Schools, The Place of the Manual Arts in Education, The Development of Appreciation, Vocational Training, the Selection and Organization of Subject Matter in the Manual Arts, The Group Method, The Factory System, the author sets forth clearly and briefly the fundamental facts underlying the teaching of the Manual Arts in schools and how the work may be carried on to the best advantage. Throughout there is shown an appreciation of the other school subjects, and the relation of the manual arts to the school curriculum. A list of questions touching each chapter are of value. The book can be used with profit not alone by those interested in the manual arts and vocational subjects, but as a reading circle book for teachers in general. As a reference book, it should be found in every library and upon the desks of school administrators."



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1918 Vol. XIX

FEBRUARY, 1918

No. 6

MANUAL TRAINING MAGAZINE

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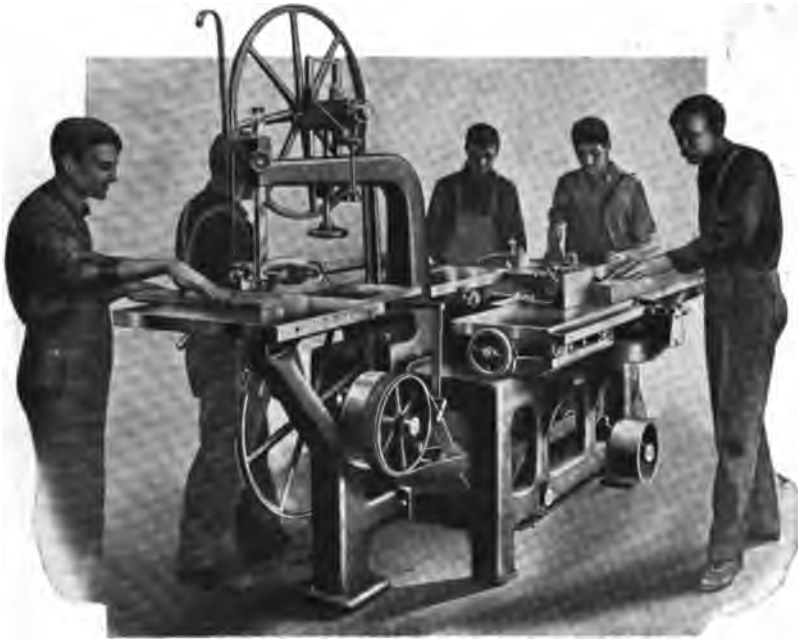
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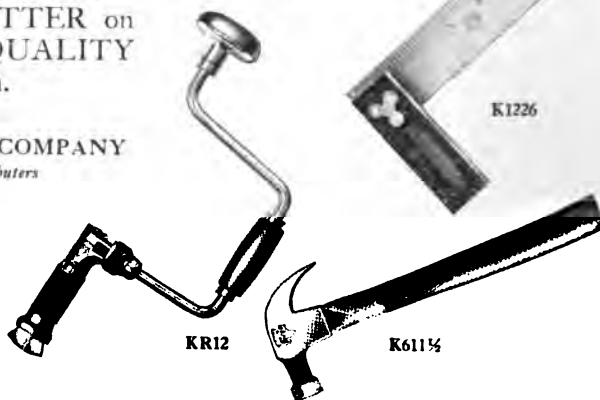
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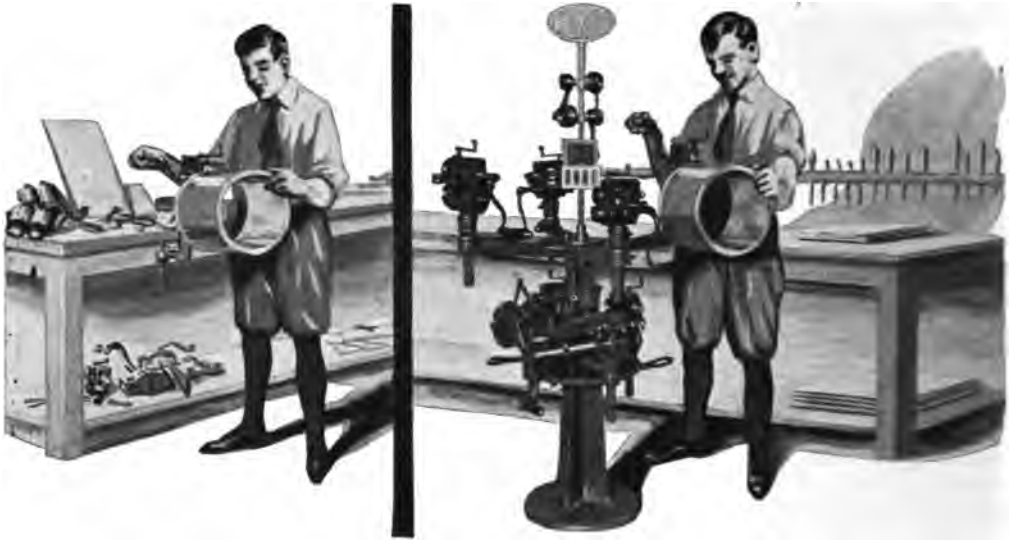
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This Magazine is kept for sale at McClurg's in Chicago, and Brentano's in New York.

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FIELD NOTES

IN AND ABOUT BOSTON.

THE speaker at the February meeting of the Boston Manual Training Club was Jeremiah Burke, assistant superintendent of public schools, Boston. The subject was "The Junior High School," a subject on which Mr. Burke is an authority, as he has given special attention to the problems of re-organization of the Boston school system relative to the intermediate school requirements.

Mr. Burke referred to education in general and to the necessity of breaking down all arbitrary divisions in the educational system. It is illogical to have a sharp line between the elementary and high schools, and one great aim of the junior high school is to bridge this unfortunate gap which now exists. At present there is a disastrous waste of teaching energy, resulting in a great loss to the pupils, as shown by the large percentage of failures in the first two years of high school. This is due to the difference in the methods used in the elementary and high schools. In the elementary school there is too much teaching; while in the high there is too little. In the establishment of the junior high or intermediate school, the pupils may be prepared gradually for the independent study which the high school demands.

In making over the educational system, the ideals of educators are for the first time being realized, though for years the defects which the new scheme will remedy have been recognized. Care must be taken not to have the junior high school a third division in the system, but one which will make for greater unity in the progress of the pupil. To accomplish this it will be necessary to retain in the intermediate school many of the elementary methods, and at the same time introduce such methods of the high school as departmental instruction.

Mr. Burke stated some of the features of the intermediate school as follows:

1. Introduction of modern languages.
2. Introduction of some algebra.
3. Introduction of some geometry.
4. Introduction of some science.
5. New and improved methods of teaching the different subjects.

Children of elementary school age can appreciate oral presentation of modern languages better than when of high school age, and when young can more easily acquire the ability to speak in a foreign tongue.

In the past, mathematics has been considered to be made up of many distinct subjects, such as arithmetic, algebra, geometry, trigonometry, calculus, etc., instead of a unity to be presented by making use of the different elements as needed to solve the problem in hand. Algebraical formulas can be introduced into the upper grades of the elementary school in such a way as to make their use in the high school problems less formal than at present. In the past, algebra alone has been responsible for a large proportion of the high-school failures. In a similar manner, the elements of geometry may be taught.

Science in the elementary school has too often been most unscientifically presented, dealing as it has with abstract principles. Instead, it should deal with such subject matter as can be related to the common experiences of the pupil. English should be taught with the aim of giving the pupil power in its use and an interest in reading.

In Boston the junior high school is a part of the elementary school organization. Teachers with special training and aptitude have been selected for the departmental work. Lectures on new methods and courses of study have been conducted by leading teachers in the different subjects throughout the city. These courses have been largely attended by principals and teachers who are giving the new problems serious study in order to be prepared for the reorganization of their work on a more efficient basis.

In considering the different groups of pupils to be served, Mr. Burke spoke of the large part to be played by the manual training and industrial teachers. We have many boys to whom the book methods of instruction do not appeal, and in order to give them the opportunity to develop along lines for which they have natural qualifications, shopwork must be provided. This should not be segregated from other school work, but should be closely correlated with it.

(Continued on p. VI.)

FIELD NOTES—(Continued from p. V.)

In this connection Mr. Burke spoke highly of the work done in the provisional schools where the academic instruction functions with the shopwork. He believes in some shopwork for all pupils because of its general educational value and the appreciation for the manual work of others which it develops.

In dividing the pupils into different courses, care must be taken to avoid the forming of class distinctions. Education should be *democratic* and the pupils in the college, commercial, and industrial groups should mingle together in school life as much as possible. The many types of schools, such as continuation, prevocational, trade, agricultural, etc., are all necessary as the true aim of all education should be to give each individual the opportunity to develop his particular talents to the highest possible state of perfection. In accomplishing this for the individual, education should also train for democratic unity; each member of society shall have a sense of personal responsibility for the common good. Such education is expensive, but we must have it.

Because of the activities of the Boston Manual Training Club in selecting a committee for war work, the State Commissioner of Education has appointed the same men as a committee to act for the State. Edward C. Emerson, of Boston, is chairman, and acting with him are Clarence M. Hunt, of Milton, and Frederick W. Ried, of Framingham. Up to date the work of the committee has consisted of circulating questionnaires and letters throughout the state to determine the availability of school shops and pupils for the production of camp, hospital, cantonment, or Y. M. C. A. furniture. The committee is co-operating with the Metropolitan Chapter of the Red Cross and aims to serve as a central agency for products made in the school shops throughout the state. As a result the committee has received orders for 100 room tables 22" square and 24 dining tables 40" square for the Naval Y. M. C. A. at Charlestown, Massachusetts, and 24 massage tables about 30" x 74", (6 of them to have extensions, 3 to the right and 3 to the left) for the Boston base hospital for reconstruction work. The order for 100 room tables has been distributed as follows:

8 tables to the East Boston high school; 16 to Boston prevocational schools for getting out parts which the Sloyd Training School will assemble; 15 to the Winthrop Street prevocational center; 10 to the A. E. Cutter prevocational center; 14 to the Brighton high school; 20 to the Everett high school; and 10 to the Milton high school. The massage tables are to be made in the Boston Trade School for Boys. The War Committee is having drawings made of articles for which there is a definite demand, such as thread winder, Belgian frame, portable frame, camp stool, folding chair, letter box, leather or cloth pouch, tin soap mold, newspaper rack, gramophone table, knocked-down clothes locker, base ball bats, cane, ping-pong bats, etc. Copies of these drawings will be sent with specifications to the several schools as the orders for the products reach the Committee.

Boston is to have one of the first base hospitals for reconstruction work for the returned soldiers. The plans are extensive and will no doubt be duplicated in other sections as needs arise. The manual activities will be divided into three main divisions: First, the bedside occupations for soldiers suffering from nervous breakdown; second, the convalescent occupations given with a view to partially prepare soldiers for vocations; third, the strictly vocational or trade instruction which will make the soldiers self-sustaining.

Mrs. Joel Goldthwait, of Boston, is organizing and directing experimental courses in bedside occupations. There are about twenty young women taking the work preparatory to becoming hospital aids. The courses include whittling and toy making, knitting and net work, embroidering, bead work, weaving and book-binding. Hospital practice is also given in Massachusetts General and the Robert Bent Brigham Hospitals.

Frank V. Thompson, assistant superintendent of public schools, Boston, is making an exhaustive study of vocations to determine in what occupations men of varying disabilities can prepare for employment. The material resulting from Mr. Thompson's work will be so systematized as to be of great value when the problems of re-educating the injured soldiers for

(Continued on p. X.)



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FIELD NOTES—(Continued from p. VI.)

well qualified for his new work, and the government is to be congratulated in securing the services of a big man for an urgent job.

In Mr. Brodhead's absence, Edward C. Emerson is acting associate director of the department of manual arts, and Francis L. Bain, formerly of the Dorchester High School, has been assigned as assistant director of manual arts.

At the March luncheon meeting of the Boston Manual Training Club, held at the Boston Architectural Club, James P. Munroe, of the Federal Board for Vocational Education was the speaker. The announced subject for discussion was "The Practical Application of the Smith-Hughes Bill." Mr. Munroe not only presented this subject in a clear and concise manner, but also spoke at some length on the work of the Federal Board in making recommendations to the War Department looking forward to the training of men for the army.

Mr. Munroe referred to the Smith-Hughes Act as the first step in the nationalization of education. As the Federal Government sets definite requirements which the states must meet in order to receive Federal aid in conducting vocational education, supervision by the National Government will naturally follow.

The following is an outline of some of the important requirements which the states under the Smith-Hughes Law must meet individually.

1. A definite plan, acceptable to the Federal Board. In case of failure to carry out the plan, national aid may be refused the following year.

2. Emphasis on the following principles:

- (a) Education must fit for useful employment.
- (b) Provision for specialized teacher training must be made.
- (c) Education must have constant expert supervision.
- (d) Education of each state must show improvement.

The aim is to take care of the boys and girls over fourteen who are taking work below college grade. This allows for aid to be given to the conduct of evening classes. One-third of the money must be spent for part-time or co-operative courses. Continuation schools are also an important feature in the scheme.

Regarding the training of teachers, Mr. Mun-

roe referred to the three types: (1) trade teacher, (2) allied subject teacher, (3) the teacher of general subjects.

The teachers of the trade subjects must be tradesmen with power to teach. The directors of allied subjects must know enough about the trade to relate their instruction to it. The teachers of general subjects must be capable of unifying the whole and meeting the all-round demands.

Mr. Munroe spoke at some length on the work of getting the plans of the forty-eight states approved and on the way in which the representatives in the different parts of the country received the Board's requirements. He praised the fine spirit of co-operation of the delegates. All were honestly anxious to build up and strengthen their educational systems, and before December 31, 1917, all states were certified to receive the Federal aid in carrying on vocational education under the provisions of the Smith-Hughes Law.

In dealing with the part played by the Federal Board in connection with the prosecution of the war, Mr. Munroe told of the memorandum which the Board put up to the War Department in January. This recommended the establishment of a war committee; first, to co-ordinate and organize the available resources for training men in mechanical lines; second, to put men to be trained in uniform and begin training as soon as possible; third, to arrange for the reimbursing of schools for the work of training the men; fourth, to retain as teachers those men qualified to give the needed training; and fifth, to ascertain in what specially trained lines men were needed and in what numbers. The last would be determined by the changing conditions at the front. These recommendations were put thru and in February a war committee on the training of men was established. An advisory committee of which the Secretary of the Federal Board is the chief agent, was also created.

In connection with this big problem, the Federal Board has made preliminary arrangements for the supervision of the educational work. The response from the technical schools throughout the country has been great, and the resources are such that from 200,000 to 300,000 men can

(Continued on p. X.)

LINS

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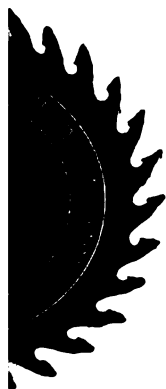
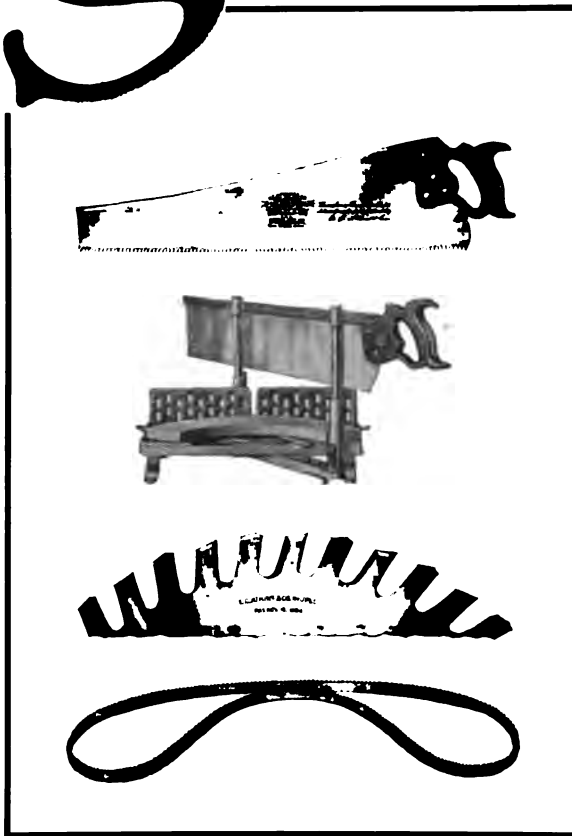
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FIELD NOTES—(Continued from p. VI.)

service are actually upon us. In Washington, disabled men are already receiving trade instruction in the Washington base hospital.

On March 4th, Boston was selected as the first of about twenty American cities to place her public school facilities in the service of the War Department in training skilled men of the second draft army. The schools to receive men are the Trade School for Boys and Mechanic Arts High School. Wentworth Institute and Franklin Union, endowed schools, will also contribute in the highly specialized work of training men for air service. The work will be carried on by the regular instructors of these schools under the supervision of army officers. The men will attend school eight hours a day and will live under army discipline in barracks near the schools. The experiment in Boston will determine the practicability of the plan, and if a success, similar groups of selected men will be given special training in other cities near the training camps.

William C. Crawford, Principal of the Boston Trade School, is to be in charge of the government school in Boston, to begin about April 1st.

—GEO. M. MORRIS.

NEW YORK CITY ITEMS.

The board of education has authorized the establishment of three additional continuation classes for apprentices in the Brooklyn Navy Yard. This makes a total of eighteen classes with a little over 300 students receiving instruction.

The establishment of continuation classes in the plant of the Morse Dry Dock and Repair Company has been authorized by the board of education for the purpose of giving additional training to workmen in shipbuilding subjects.

Two classes for the training of journeymen shipfitters were opened Monday, March 4th.

Classes in other subjects will undoubtedly be opened in the near future, and it is also hoped that classes similar to those conducted in the Navy Yard, may be established for apprentices.

A large number of applications have been received from drafted men for training in war service classes. These classes are being opened

and established as rapidly as possible, and it is expected in the near future that several thousand students will be under instruction. It is also proposed to establish classes in marine engineering and similar subjects as a result of the exigencies growing out of the war conditions.

—CHARLES B. HOWE.

A meeting of the School Craft Club, New York City, was held at the Broadway Central Hotel on February 16th. A dinner was served at 5:00 P. M. with the following round-table program beginning at 8:00 P. M.: (1) "Teaching Material and the Shop Museum," by W. A. Carter; (2) "Construction of the Wattless Transformer and Motor that can be run from House Current," by E. F. Judd; (3) "Forging in the High School Shop," by Russel F. Hennion; (4) "The Continuation School as an Agency for Meeting Present Demands for Vocational Education," by F. Theodore Struck; (5) "Shopwork in Democracy and Democracy in Shopwork, Suggestion vs. Command," by Lawrence J. Young.

The Associated Teachers of Shopwork of the City of New York met in the Brooklyn Daily Eagle Auditorium at 10:30 A. M. on February 16th. The program was as follows: Greeting and Address by Honorable Albert Lind; "School Problems," by Ezra Putnoi; "Our Organization," open discussion.

NEWS FROM THE NORTHWEST

The first class in vocational education established in Seattle under the Smith-Hughes Bill is in operation at the Broadway High School. Sixteen boys are enrolled, ranging in age from 14 to 19 years, and they are to remain in the class one year. Their program consists of three hours in the machine shop, one hour of mechanical drawing, one hour of shop mathematics, and one hour of English daily. This class is starting under very favorable conditions, for the instructors are men with more than the required shop experience and have been regular instructors at the high school for a number of years. The courses are well planned. In the shop some of the problems are screw vises for the wood-

(Continued on p. XIV.)



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FIELD NOTES—(Continued from p. X.)

working benches of other school shops, grinder stands, and wood-turning lathes. Mr. Bryant, the shop instructor, while he realizes that in the 600 hours the boys will spend with him he will not be able to produce highly skilled mechanics, yet he will strive to inculcate habits of accuracy, dependability and thoroughness, which is, of course, the proper foundation for success in all trades.

C. B. Gwynn, who was to have taken charge of the teacher-training work in Washington in connection with the Smith-Hughes Bill, was unable to report for duty. His place has been filled by the appointment of George Jensen, of Stockton, California.

At a recent meeting of the Whatcom County Vocational Club, every teacher of manual arts and domestic science in the county was present. Charles R. Scudder was elected president, and under his leadership the club will conduct studies in the problem of vocational education.

The Inland Empire Teachers' Association will hold its annual meeting in Spokane, April 4th and 5th. A strong program is being provided for the manual arts sectional meetings.

—E. G. ANDERSON.

NEWS ITEMS FROM EL PASO, TEXAS.

The El Paso school board has authorized the organization of a class for radio and buzzer operators, to be carried on as a night class, meeting six evenings a week for two hours each evening, and to keep the room provided open on Sunday afternoons, that the students may come to practice.

The class was organized under the direction of the manual arts supervisor, January 28th. S. E. Patton, an experienced signal service operator and instructor was engaged to take charge of the class, which enrolled forty-five the first night. Only men subject to the Army draft and those enlisted in the signal service were admitted to the class. Some of these men are working very hard in an effort to become as proficient as possible before being called into service, which will be very shortly with some. Five or six have attained a speed of sending and receiving nine to ten words a minute already.

The domestic science classes of the El Paso schools have given up much of the regular work the past term, to do work for the Red Cross. Comfort bags, hospital shirts and socks, and surgical dressings have been made. The girls of the high school classes made some very good records in making surgical wipes, a hundred per cent. of the wipes made being accepted at various times. Some knitting has also been done by classes in the upper grammar grades.

In the junior high school a prevocational plan of manual arts is being tried out this year. At the beginning of the year, a shop was fitted up for carrying on five different types of occupational instruction, namely: forge practice, sheet-metal work, electrical work, cement construction and industrial woodworking. Outside of the work of this shop, the boys of the eighth and ninth grades are privileged to elect work in printing, mechanical drawing and woodworking in the regular high-school shops. A similar provision has been made for the girls of these grades, and a room is fitted up for carrying on three or four different lines of work, under the same instructor.

Altho this plan was in the nature of an experiment when it was introduced, it can no longer be considered so, for the plan is proving a success. The success is due, in no small degree, to the able instructors selected to put the plan over. The shop for boys was started under E. C. Beezley, of the Pittsburg, Kansas, Normal School, who left El Paso early in the year, and was succeeded by W. Melvin Fox, of the University of Wisconsin. The work for girls is under the direction of Miss Helen Swift, of the University of Texas.

The success of the prevocational plan in our junior high school is already bringing about a stronger demand for vocational courses along some of these lines in our high school, and the question of equipment for some of the shops which were provided in our new high school building, and which were not equipped a year ago on account of the difficulty in securing metal-working equipment, is now being taken up. Equipment for forge work, machine shop, and sheet metal are being considered. If the machine shop is installed, a course in automobile repair work will be introduced also.

(Continued on p. XVI.)

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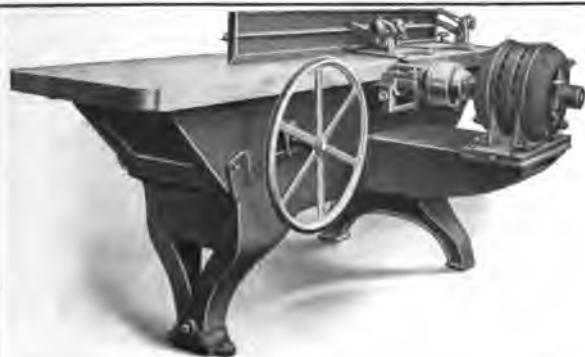
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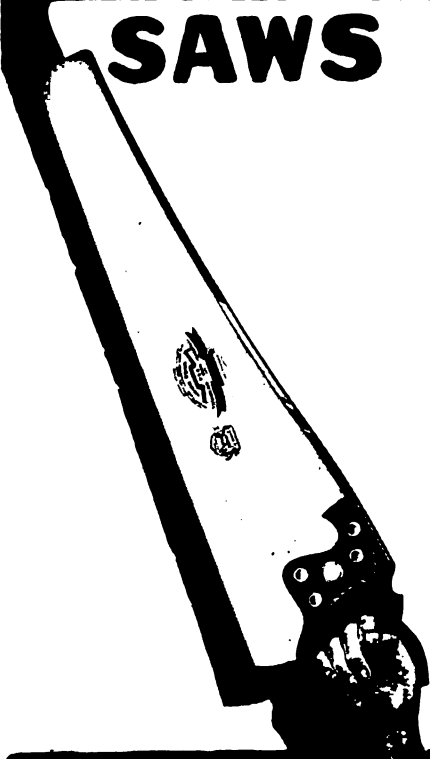
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FIELD NOTES

(Continued from p. XIV.)

A class in mechanical drawing is carried on in connection with the regular night school. This class has proven to be filling a real need as the enrollment has been all that can be accommodated since the class was started. Charles A. Kinney is the new instructor in mechanical drawing in the high school and night school. The former instructor, D. E. Chenault, was called into army service in the first draft call, and is now serving in the repair department, Quartermaster's Department, Fort Sam Houston, San Antonio, Texas.

The beginning of the second half of the year saw many changes in the teaching force in manual arts. E. C. Beezley left to accept a position in Wichita, Kansas; S. S. Snyder, to take a position at Wilcox, Arizona; E. A. Carlson resigned to enter some training school for Army service; and D. E. Chenault called to service in the draft. The following new instructors were secured to fill the places made vacant; Chas A. Kinney, Lewis A. Osborn, J. L. Woods and W. Melvin Fox. Miss Maude Goldsmith, formerly a teacher of drawing in the schools, was transferred to manual training work in one of the grammar-grade shops.

A special effort is being made this year to emphasize the industrial idea in all of the manual arts work thru both elementary grades and high school. A special study is being made in the monthly institutes, of methods of introducing more instruction of an industrial nature in the shopwork. As an aid in this direction, an industrial survey is being made of the City of El Paso, with the idea of finding out as much as possible about the local industries, and also to find out the opportunities offered by these industries to the boy or girl leaving the public schools either at the eighth grade or on completion of the high school. Each member of the manual arts teaching force is making a personal visit to a number of the commercial and manufacturing establishments, making a study of their methods of carrying on these industries, and having the manager of each institution fill out a questionnaire covering the information that will be of the greatest benefit to the department, in our efforts to make the manual arts instruction of the greatest service in imparting industrial knowledge to the pupils of our public schools.

—W. A. BURK, Supervisor.

(Continued on p. XVII.)



FIELD NOTES

(Continued from p. XVI.)

The Council of the Western Drawing and Manual Training Association has just decided to postpone this year's meeting in order to co-operate with the government in the effort to keep the freight and passenger cars free for the transportation of men and materials for war purposes. The meeting was to have been held in St. Paul.

The industrial department of the high school in Hamilton, Ohio, has been equipped with a new printing plant, consisting of a 10 x 15 Gordon press, a 14 x 22 National press, one No. 30 Diamond paper cutter, four Pittsburgh print shop stands, one unit imposing table 36 x 60 stone, and the necessary small fixtures and type for such a shop. A full four-year course in printing is being offered in the high school along with the necessary short courses. Another practical printer has been added to the corps of teachers.

A course in telegraphy has been introduced in the high school and is being taken by 40 students and 25 army selects. The International Wireless Code is being taught by expert operators from the Western Union. Howard G. Carter is supervisor of the industrial work in Hamilton.

Charles B. Howe, who for several years has been head of the manual arts department at the Bushwick High School, New York City, has been appointed assistant to Dr. William L. Ettlinger, superintendent in charge of vocational activities. In this new position Mr. Howe will have supervision of industrial continuation classes and emergency war service, in connection with the training of industrial workers. He will continue also as principal of the Bushwick Evening Trade School.

Massachusetts has furnished the following instructors for training teachers of ship building at the Newport News Ship Building Company's plant: Egbert E. MacNary, director of vocational school, Springfield; Charles R. Allen, agent of the Massachusetts Board of Education; A. H. Morrison, Mechanic Arts High School, Boston; H. S. Hall, Framingham; E. M. Longfield, Boston Trade School; Harry L. Jones, director of industrial education, Somerville.

(Continued on p. XVIII.)

ELEMENTARY FORGE PRACTICE

by

ROBERT H. HARCOURT

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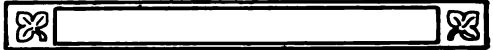
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FIELD NOTES

(Continued from p. XVIII.)

Vocational Education for Wisconsin in place of Frank L. Glynn, resigned. Mr. Callahan has been superintendent of schools at Menasha for a number of years.

A detachment of enlisted soldiers are now receiving practical training in shop work at the University of Wisconsin. The following are some of the courses offered: woodwork, machine shop work, forge work, welding, gas engine work, electrical work and sheet-metal work. Courses in academic work are also offered. The work is under the supervision of the regular army officers.

A special course to meet the demand for manual training teachers is being offered at Stout Institute. This course started some time ago, and is to be continued thru the summer session until about the end of August. The Milwaukee Normal is also offering such a course.

As state director of the Boys Working Reserve for Wisconsin, assistant state superintendent J. B. Borden organized the members of the state department and also some of the members of the university agricultural colleges for speaking campaigns in every county in the state. The purpose of the campaigns was to get the boys out on the farm by the 15th of April. A special bulletin was published covering the main points of the work which was distributed to all high school students. Boys going on the farm are to receive credit for their school work when it is proved that they have satisfactorily accomplished the work on the farm.

Alfred Madsen, who was teacher of manual training in the Milwaukee graded schools, has now been appointed assistant in manual training at Milwaukee Normal School.

E. E. Gunn, director of vocational work at Green Bay, has resigned to take charge of emergency work in the Green Bay district.

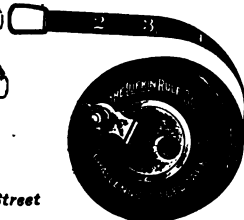
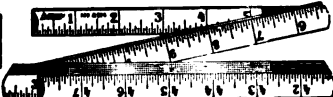
During the past school year nine high schools have added manual training to the high school and grade courses in Wisconsin.

The Vocational Board of Wisconsin has voted to abolish the \$100 fee for resident students of Wisconsin. Students from other states will still be required to pay this fee.

Since the beginning of the draft, 18 of the 54 school shops in Philadelphia have had to close

(Continued on p. XXII.)

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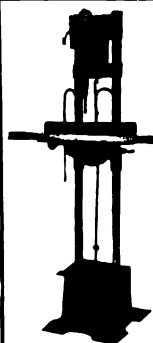
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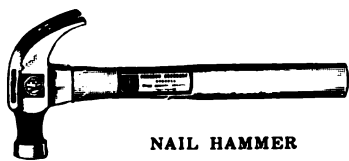
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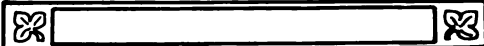
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FIELD NOTES

(Continued from p. XX.)

for lack of teachers. By employing women teachers, four of the shops have been re-opened. It is impossible to get enough shop teachers since wages in industry have advanced so much. In Evansville, Indiana, Eugene C. Graham was obliged to appoint two boys, just graduated from the manual training department, to fill vacancies. Other cities no doubt will find it necessary to look to their 1918 manual training graduates to carry on the work next year.

The number of returned soldiers attending the vocational training classes at the Montreal Technical School has more than doubled in the last few months. There are 230 enrolled now, and 336 men have taken the course previously. Many of the men have done remarkably well, learning in some instances the professional side of a trade in which they were engaged before the war. Carpenters, bricklayers and masons study mechanical and architectural drawing, for example, and if they do not become architects at once, they at least greatly increase their value in their old trades and prepare themselves to occupy higher positions.

Owing to unsettled conditions in many of the schools which have tendered their buildings and equipment to the Government for war work, the question of summer school courses for teachers is still indefinite in some of them. Since publishing the data on summer school courses in the April issue, two of the leading technical schools, namely, Bradley Institute and Stout Institute, have been obliged to modify their summer school work for the coming year. Teachers contemplating summer work in any school would do well to get last-minute information before reaching definite conclusions.

On March 21st the seventh exhibition of the work of the evening classes was held at Wentworth Institute. A special exhibit of war posters designed and printed in the Institute, and also an exhibit of war work and training, were features of particular interest.

A fine new Mahlstedt's multicolor press has recently been installed in the printing department of the Springfield Vocational School, Springfield, Massachusetts. We understand that

(Continued on p. XXIV.)

VENUS PENCILS

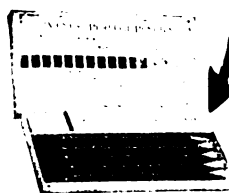


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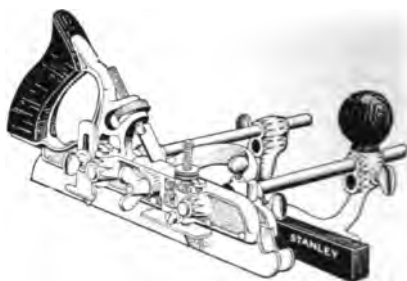
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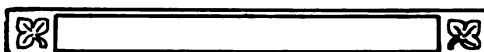
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M.T.M.-6-18



FIELD NOTES

(Continued from p. XVII.)

the repair shop under the direction of Joseph F. Parks, supervisor of manual training.

J. J. Ritter, director of manual training in Ft. Wayne, Indiana, has been directing the work of the school shops along war lines. A part of the work has consisted in making furniture for the local Red Cross quarters, including card tables, screens, lounging chairs, etc. In addition they have agreed to make 100 packing boxes.

Vocational teachers in the three Wisconsin cities of Sheboygan, Racine and Kenosha, have been giving trade instruction to large classes of army registrants. In Sheboygan 206 out of 350 army men registered for night instruction.

Boys in the manual training department of the high school at Superior, Wisconsin, are making two boats and three canoes which are to be donated to the Y. M. C. A. N. A. Valby is superintending the work.

The manual training class in the high school at Haverfield, Massachusetts, recently completed 10 substantially built checker-board tables which were sent to Camp Meade. The stock was paid for by the pupils and the construction work was done by the manual-training class.

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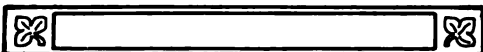
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TRADE NOTES

The latest book on forging is *Elementary Forge Practice*, by Robert H. Harcourt. It contains 42 exercises, varying in difficulty from an S-hook to the various forms of hammers, and has been used as a textbook in the author's classes at Stanford University with marked results, demonstrating the following advantages: (1) Taking of notes during a lecture is partially eliminated, so that a student has the fullest opportunity for watching the entire demonstration, the text being a ready reference in case he does not remember a demonstrated point; (2) students are able to proceed with the exercises without much instruction, thus saving time; (3) students make the exercises better and in a shorter period of time; (4) the instructor is able to handle a large number of students efficiently and without confusion; (5) the initiative of the student, as well as his ability to work from drawings is developed.



Most of our readers know, but the general public does not, that the tops of all extension tables are supported by table slides, and even our readers may not know that one of the oldest and largest manufacturers of such slides is B. Walter & Co., Wabash, Indiana. This firm supplies slides for approximately 400,000 tables annually, and shop teachers who are building tables will be glad to have this firm's name on their list for shop specialties. The above illustration suggests the construction of their slides.

The quality of Dixon's "Eldorado" pencils is well brought out in the January number of "Graphite," their house organ, the frontispiece of which contains a fac-simile of a letter of recommendation from Harrison Fisher. The "Eldorado" is made in 17 degrees of hardness, to meet the varying needs of pencil users. To the manufacture of this pencil has been given the results of 90 years' experience in pencil manufacturing.

The Stout Institute

Summer Session, July 29 - Aug. 30, 1918

Because of the nation wide interest in vocational education, The Stout Institute summer session this year will give special attention to that phase of educational work by offering:

1. Courses for Directors of Vocational Schools.
 - a. Teacher training while in service.
 - b. Organization of vocational courses and instructional matter.
 - c. Relation of vocational schools to state and national laws.
 - d. Vocational school records and accounting.
2. Courses for teachers in Vocational Schools.
 - a. Methods and management in vocational teaching.
 - b. Shop, laboratory, and academic courses.

As in the past, courses will be offered designed to meet the needs of teachers and supervisors of Industrial Arts and of Household Arts work.

The Stout Institute was by action of the legislature in 1917 authorized to offer four year courses and grant degrees. The four year courses are now being offered. The two year courses will be continued.

Opportunity to take work for credit in the two year and the four year courses will be offered in the summer session.

The summer session catalog will be ready for distribution the latter part of April.

For further information address

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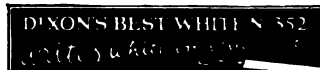
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BOOK NOTES

IT HAS been truthfully said that one does not know lettering until he has made a study of the Roman alphabet. The Roman alphabet is fundamental, yet as one looks over school exhibits he seldom sees evidence that Roman letters have been given the attention they deserve. It is therefore encouraging to receive from Frank Forrest Frederick, director of the School of Industrial Arts, Trenton, New Jersey, a pamphlet entitled, *A Roman Alphabet and How to Use It*, which he has prepared and published for the use of his students. This pamphlet sells for 75 cents.

Mr. Frederick believes that the art of lettering can be taught, but not by the usual practice of merely inducing students to copy letters in a haphazard way. Such procedure, he believes, is a waste of time. This book shows a better way.

A NOTE-BOOK ON FOOD PREPARATION.

Many books have been written on domestic science. Some of these have been the result of laboratory research; others have presented the point of view of the practical cook; still others have presented subject-matter from the teacher's viewpoint as the result of experience in teaching. It has remained for Mrs. Beth Warner Josserand to combine these into a student's note-book, guide and laboratory manual. This book is entitled *Food Preparation*. It represents the best in science and the best in methods of teaching to classes. As presented in this book, food preparation is indeed a science, comparable in subject-matter and method to the other sciences that have gained a place in the schools. It is not mere cooking by recipe.

This book was first published by The Domestic Science Publishing Co., of Cimarron, Kansas. The new and revised edition is now being published in two parts by The Manual Arts Press. It is confidently believed that this book will do much to set a higher standard in the teaching of foods and food preparation, which is especially needed at the present time. If the scientific methods, facts and viewpoint of this book could reach all high school girls, one of the big problems in food conservation would be solved.

Mrs. Josserand has received superior training in science at the University of Illinois and has had experience in high school and college teaching and in the training of teachers at the Kansas State Normal College, Emporia, where

she was formerly professor of home economics. She has come in contact with school and home problems also thru practical experience and thru college extension work. She has recently been engaged in the Government "Food Conservation Drive" under the Kansas State College of Agriculture.

The U. S. Government has adopted *Essentials of Woodworking* by Griffith for use in woodworking classes in the Island of Porto Rico. This book will be used under the supervision of Frank S. Pugh, director of manual arts for Porto Rico, who has "58 schools in 58 different towns and transportation is by bull cart to half of them."

The following letter tells its own story and is typical of the comments on the new book by C. A. Bennett, entitled *The Manual Arts*.

Bloomington, Indiana.

August 2, 1917.

My dear Mr. Bennett:

I have read with great pleasure the recent compilation of your lectures and wish to express my appreciation of the contribution which you have made. It seems to me the point of view you have presented is extremely suggestive and well warrants careful consideration and study. I wish the book could be in the hands of every manual training teacher, as it would convince them of the necessity of broadening the scope of their work and would generate an interest in the larger problems of which so many manual training teachers are entirely ignorant; and, I dare say, unsympathetic.

I should be happy indeed if this statement might be used in helping to convince manual training teachers of the necessity of carefully reviewing this contribution.

Sincerely yours,

B. J. LEONARD.

Another book of "essentials!" This time it is *Essentials of Mechanical Drafting*, by Ludwig Frank, instructor in drawing at the High School of Commerce, Boston. This is a textbook on the theory and practice of mechanical drawing. It is designed to be used with any course of problems. It is attractive in appearance, good in technic, and deals with fundamentals. It is published by the Milton Bradley Co.

THE GRINDER THAT IS "STUDENT PROOF"

HERE is a grinder that meets the every day grinding conditions of the school shop—stands up under wear and tear, always ready for work; strong durable, wonderfully easy running.

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Every machine is made of the best possible materials, accurately assembled, nicely finished. The Carborundum Wheel is the fastest, cleanest cutting wheel for tool sharpening and for all around grinding and the special tool grinding guides simplify tool sharpening.

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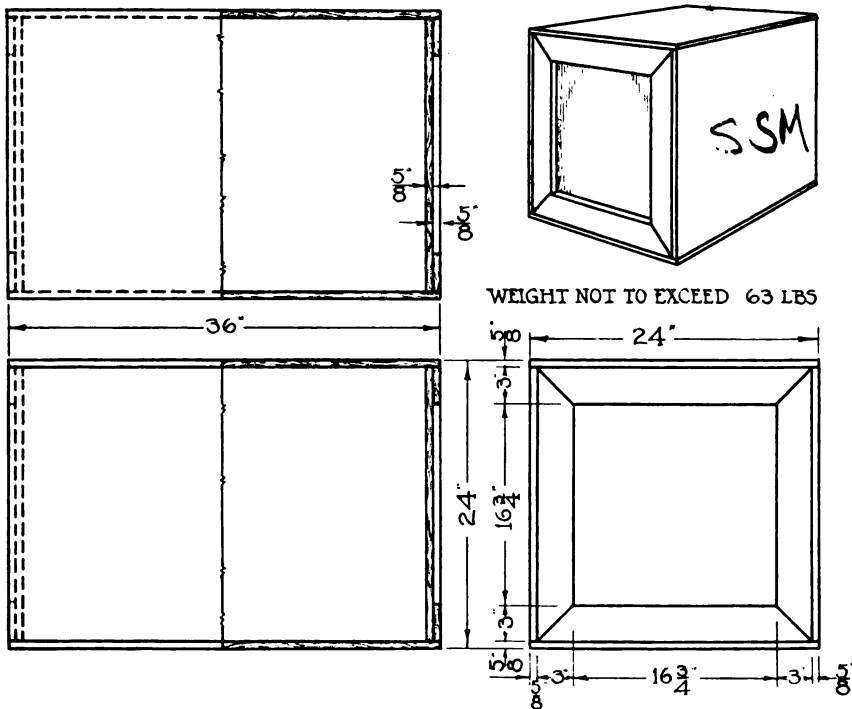
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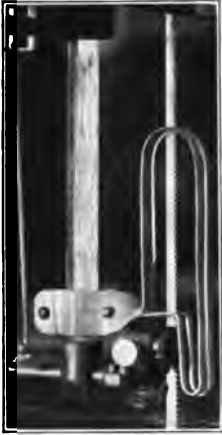
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MANUAL TRAINING MAGAZINE

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FIELD NOTES

FOR the purpose of studying the Canadian system of vocational re-education and rehabilitation, Charles A. Greathouse and Arthur E. Holder, members of the Federal Board for Vocational Education, recently made a visit to Canada. Canadian officials gave them every opportunity to observe each step beginning with the therapeutic training of the medical department and concluding with the educational and industrial work of the civil departments.

Basing his figures upon the experience of Canada, a writer in the *New York Sun* estimates that if an army of 5,000,000 men is sent to France there will be 150,000 disabled men needing vocational training as a result, and 6,000 qualified teachers must be provided. Since teaching of that sort is almost an unthought-of thing in this country, the greater part of the 6,000 teachers must be trained before they can become useful, and they will need to be exceptional men, for they will have an exceptionally hard class of pupils to handle.

In view of present agitation on the subject, it is quite likely that this re-education will be extended to include industrial cripples also.

With a vision worthy of the cause, the Boston School of Occupational Therapy is already in operation. There is an immediate need in our military hospitals for trained women to furnish forms of bedside occupation and to direct the handwork of disabled soldiers, and it is the purpose of this school to furnish the necessary training for such work. The school is under the leadership of Arthur L. Williston, director of Wentworth Institute, and is authorized by the Surgeon-General of the United States Army. Miss Florence O. Bean, of Boston, is directing the handwork activities as well as teaching some of them, and George M. Morris is directing the course in woodwork, with Josef Sandberg as instructor.

Detailed information can be secured by writing to Dean Sarah M. Lake, Franklin Union, Boston.

AROUND NEW YORK

The Division of Vocational Activities of the Department of Education of New York City,

under former Associate, now Superintendent, Dr. Wm. L. Ettinger, is continuing its campaign of organizing vocational classes to meet the pressing needs of war service and shipbuilding. During the last month, the department of continuation classes under the immediate direction of Charles B. Howe has organized the following courses: (1) An additional day continuation class for coppersmiths at the Morse Dry Dock and Repair Co., Brooklyn; (2) day continuation classes in mechanical drawing, applied science, applied electricity, shop English and shop mathematics at the Cortland Electric Co., Sperry Bldg., Brooklyn; (3) short unit courses in shipbuilding under the direction of Maurice Siegel, assistant superintendent of evening schools, are offered to helpers and men engaged in the trades at the Bushwick Evening Trade School, 400 Irving Avenue, Brooklyn, and the Brooklyn Evening Technical School, Seventh Avenue and Fourth Street. The following are among the evening courses offered: Mold loft work (elementary and advanced); shipfitting; riveting, caulking and chipping; shipwright work (including wood caulking); wooden shipbuilding; ship joinery; marine boiler making; ship plumbing and pipe-fitting; ship electrician's work; outside machinist work; ship coppersmithing; ship blacksmith work; hull drafting; sketch making (for skilled mechanics); general ship information course (for ship-yard beginners who are not sufficiently advanced to take other courses).

Each course is in charge of an instructor, who is a skilled mechanic working at the trade. Classes meet two evenings each week from 7:45 to 9:45 for ten weeks. Certificates will be issued to all who successfully complete the work of the course.

All interested in vocational education may be well pleased with the recent election of Dr. William L. Ettinger, as superintendent of schools of New York City. As associate superintendent in charge of vocational activities, he has organized an effective system of vocational education. The Ettinger plan of pre-vocational education has solved a definite problem in the upper grades of the elementary schools. Following his election Dr. Ettinger outlined many educational reforms. From the standpoint of adminis-

(Continued on p. VI.)

tration, he believes it is of immediate importance that our attention be directed to the formulation of educational policies that will make the instruction of children in the elementary grades more thorough; that will provide for the democratization of the education of the older pupils in the elementary schools through the choice of differentiated academic, commercial and industrial courses, and at the same time do away with the present hiatus that exists between the elementary and the high schools. Moreover, the demands of war conditions have awakened all to the value of vocational education, whether it be commercial or industrial. It is not so long ago that one had to defend any change from the older bookish curriculum, but the urgent demands of the Federal government, that the schools immediately assist, thru their regular and special courses in training certain types of workers, should impress upon us the fact that no future emergency should find us equally unprepared because of lack of vision of those in responsible charge of our educational system.

"The thorough democratization of our schools should mean not only enlarged aggressive loyalty finding expression in the performance of patriotic service, such as our pupils, teachers, and superintendents have rendered to unexcelled degree, but also such methods of administration, as will encourage and utilize the latent ability within our professional staff, and the adoption of a curriculum and methods of supervision as will enable us to meet the varied needs of the vast army of children intrusted to our care."

WILLIAM H. DOOLEY.

INDUSTRIAL ARTS ROUND TABLE.

On May 4th the Chicago Industrial Arts Round Table Club went on an excursion to Mooseheart, thirty-five miles west of Chicago. Mooseheart is a little wonder city all by itself. It is a great industrial home built by the Loyal Order of Moose to provide for children of deceased members of the fraternity.

The estate consists of more than one thousand acres of land situated along the bank of the beautiful Fox river. The children live in houses built on the estate, a unit of about twelve chil-

dren living in each house, in charge of a proctor or matron. By living in small groups it is much easier to preserve the home life and home atmosphere so essential to the proper rearing of young children. The visitor on entering Mooseheart is first impressed by the absence of the uniformity and spirit of morbidness so often found in homes for dependents; on the contrary, the joy and good cheer of home life seemed to be just as active here as in the best regulated family home, with laughing, playing children, beautiful scenery, and where the boys and girls learn the practical side of life. The entire institution is under the direct management of Superintendent Adams who, through his close study of human nature, and with his pleasing personality, seemed a real father to every one of the nearly five hundred boys and girls enrolled in the home. From the youngest babe in the nursery to the oldest boy or girl, the close relationship and personal touch as of father to child was a prevailing feature of the home, and no doubt adds much to the homelike and comfortable atmosphere of the entire institution.

This close comradeship between official and students finds its reaction in the larger boys assuming the attitude of "big brother" to the smaller boys.

As its name implies, the plant is organized as a vocational school, but the cultural and academic education is by no means neglected. Mr. Adams does not believe in confining the training too strictly to subjects, but he believes in strong courses for every boy and girl to train for civic and social responsibility. He is developing this idea in many ways. One example is the student boards of control in which the students themselves administer the discipline of the school; also many policies of the school are determined by the student body in general assembly meetings. One cannot help but feel the real spirit of democracy which seems so prevalent in every department. With this training the boys and girls are better equipped to go out and do their work in the world of realities.

The Round Table Club appreciated very much the interest and courtesy shown them by Mr. Adams, he, personally conducting the party about the big estate and explaining the aims and plans for the operation of the big school.

(Continued on p. VIII.)



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FIELD NOTES

NEWS FROM THE NORTHWEST

THE state vocational education director for Washington, C. R. Frazier, reports that the state plans have been approved by the Federal government and that they are being put into effect quite rapidly. Plans for teacher-training have been made at both the State University and the State College. C. B. Gwynn, of the Cheney Normal School, has been selected to head the teacher-training work at the University and will begin work February 1st.

H. M. Skidmore, of the State College, has been elected by the State Board as assistant director in charge of agriculture. He will give three-fourths of his time to this work, and has been elected by the State College to take charge of the teacher-training work in agriculture in that institution, to which he will devote one-fourth of his time.

Teacher-training in home economics is being instituted at both the State College and the State University. Courses of study have been prepared and will soon be submitted for approval by the State and Federal Boards. It has been decided to divide the funds available for teacher-training equally between the three lines of work. This gives a little over \$2,000 of Federal money to each field.

Dean Frederick E. Bolton, of the College of Education of the University, and Miss Raitt, of the Home Economics Department, and Dean Cleveland and Miss Craig of the State College, are actively and enthusiastically planning to make this work highly successful. Federal Agents Johnson, Hummel and Miss Loomis have rendered valuable assistance.

Already applications for recognition for the semester beginning February 1st have been received from Bellingham, Everett, Spokane, Broadway High School, Seattle, Snohomish, Clarkston, Aberdeen and Yakima. Auburn, Tacoma, Toppenish and Walla Walla are planning courses for recognition for the next school year. Undoubtedly many other towns will apply for recognition beginning with September 1918.

Very practical work is being carried on in the Orchard Homes school of Missoula, Montana.

Lester C. Ennis, the supervisor of manual arts in Missoula, interested the pupils of that school in poultry raising, and under his direction they constructed a chicken coop with all the approved appliances for the successful care of poultry. Ten trap nests are a part of the equipment. The pupils will trap and keep an accurate account of all birds. Lumber costs and other specifications for the building were figured out in the regular arithmetic classes. The instruction in the care of poultry is being given by the school clerk who is a very successful poultryman.

WASHINGTON MANUAL ARTS ASSOCIATION

The Washington Manual Arts Association will meet in Seattle, March 23d. An invitation has been sent to the superintendents of schools of the various cities in the state to meet with the Association as its guests. This invitation was given partly because Frank B. Cooper, superintendent of Seattle schools, is on the program with an address relative to the junior high school, which will be especially interesting to superintendents, and also because the problem of vocational education in each community must be largely solved by the superintendents and the teachers and supervisors of manual arts, thus a common understanding of the problem is to their mutual advantage.

The program for the meeting is attractive and a large attendance is assured. The association is fortunate in securing Mr. Cooper to speak, for he has done as much or more than any other superintendent in furthering the work of industrial education in the schools, and he doubtless will have an inspiring message relative to this work and its possibilities in the junior high school.

C. R. Frazier, state director of vocational education, will discuss the problem of vocational education in Washington, and R. W. Moore, acting supervisor of industrial education in Seattle, will present a course of study for manual arts in the junior high school. Others on the program are Charles R. Scudder, of Bellingham Normal, who will discuss the problem of hand-

(Continued on p. VI.)



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ANNOUNCEMENTS

I. The Editors are pleased to announce that George M. Morris, Assistant Director of Manual Arts in the city of Boston will be the special editorial representative of this *Magazine for the New England States*. He will send a monthly contribution of items of current interest. Subscribers living in New England are urged to assist Mr. Morris by sending him such facts as he will need. He may be addressed at the Boston Normal School.

II. Acting in a similar capacity, Edward G. Anderson, an industrial center instructor in Seattle will represent the far Northwest—Washington, Oregon, Idaho and Montana. It is hoped that he will have the cordial support of all the men in his territory. His address is 927 Ravenna Boulevard, Seattle, Washington.

III. The two departments, "Editorial Comment" and "Of Current Interest," will hereafter be combined, as they are in this issue, under the heading "Editorial Review of the Month." It is the purpose of the Editors to make this new department one of vital interest to every live and growing teacher of manual arts subjects in public schools.

IV. In selecting articles for the coming year the Editors have aimed to secure such as will let the readers know how some of the newer ideas in industrial education are being worked out and how some of the older ideas are expanding. For example, more information is needed on "related work." This subject will be very fully presented by Egbert E. MacNary, director of Industrial Education in Springfield, Mass. "Cooperative Part-time Work" is new; James C. Clarke of Boston will tell some of his experiences in such work. Parker B. Pratt will show how a school is serving a community in Utah; Edward G. Anderson will tell a somewhat similar story about a school in Washington. Robert W. Schneider of Highland Park, Ill., will set forth and very fully illustrate how a township high school has equipped for a modern course in industrial arts. Articles more technical in character will give practical suggestions in carpentry, wood-carving, woodwork design, mechanical drawing, printing, metal-working, etc. These will reflect the progress being made in these subjects, and especially, adaptations to new conditions.

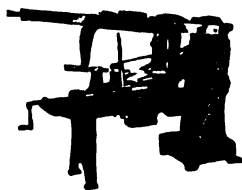
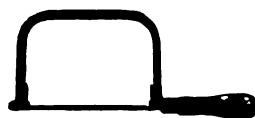
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FIELD NOTES

IT IS the crises of life that reveal strength and weakness, and this is just as true in national life as in the life of the individual. It may be that there are still some who are not friendly to industrial training as a part of the public school curriculum; if so, the schools will surely justify this form of education before the war is over. When students going out from school step in and take the places of skilled and semi-skilled workers to the extent that the various industries continue without serious handicap, the value of industrial training as a part of the school curriculum is proven.

The schools are awake to the needs in our present national crisis and a concerted movement is being made thruout the country to emphasize all kinds of industrial training as never before. The Bureau of Education, Washington, D. C., has distributed widely "An Educational Program for the War," which urges certain definite lines of effort for the period of the war, and even for the reconstruction period that will follow.

Conspicuous examples of ready response are seen in the continuation and trade schools. A short time ago a large machine shop in South Boston lost twenty of its employes as a result of President Wilson's call to the colors. The superintendent of the shop communicated with the continuation school, and in a few hours every idle machine was working again. And the encouraging feature of this instance is the report that the boys obtained from the continuation school have made good and will be retained by the superintendent of the machine shop.

When one realizes that the present war is a war of machines instead of men, he will appreciate how necessary to raise up workers skilled in the manufacture of machines.

BOSTON ACTIVITIES

The May meeting of the Boston Manual Training Club was opened with remarks by the president on the recent death of one of the Club's most prominent members, Alexander Miller. Mr. Emerson was followed by Mr. Brodhead, who, as chairman of the committee appointed at a previous meeting, read the following memorial, which was adopted by the Club:

"Mr. Miller was an example of what is often

thought to be a new idea, a teacher taken from the shop. Born and educated in Scotland, he came to Boston as a young man and was employed in a large woodworking establishment. Realizing the need for a better education, he attended both the Massachusetts Normal Art School and the Sloyd Training School of Boston, and was graduated from the former. He reflected great credit on both these schools. Beginning his teaching career as a teacher of manual training in the elementary schools of Boston, in Charlestown, East Boston, and West Roxbury, and in the Brighton High School, he was also teacher and later, for many years, principal of the East Boston Evening Drawing School. He studied for two years copper designing and jewelry in the Rhode Island School of Design.

"His human interest in boys was evidenced by his yearly regattas on the frog pond on Boston Common, when the small yachts resulting from his instruction competed for modest prizes in the presence of their enthusiastic builders.

"From the Boston Service, he was called to the Brookline (Massachusetts) High School where he worthily conducted classes in Mechanical Drawing and Art Metal Work until he was incapacitated by the illness which resulted in his death, while still in his prime.

"His home life was ideal, and he leaves a heartbroken wife to whom he was everything. His home, with its dignified furnishings, flowers, and fine pictures reflected the artist, and his summers were spent in communion with nature on the shores of Buzzards Bay. He was connected for two summers with Wisconsin University, and spent his last summer in an art colony in the Berkshires.

"Mr. Miller was one of the seven charter members of the Boston Manual Training Club, founded in 1898, and was its second president, serving it also in the same capacity during the season of 1915-1916.

"A quiet, unobtrusive man, of clean life and substantial attainments, he is deeply mourned by his friends and associates, and will be remembered with fond appreciation by all who have been so fortunate as to come under his instruction."

(Continued on p. VI.)

FIELD NOTES—(Continued from p. V.)

James C. Clarke, another charter member, told of the early life of Mr. Miller, and of his inspirational influence on all who knew him.

The business part of the meeting resulted in the election of the following officers for the coming year:

President, Edward C. Emerson; vice-president, George M. Morris; secretary, Andrew J. Leahy; treasurer, George F. Hatch; librarian, James C. Clarke.

With the exception of the librarian the above are reelections of the officers of the past year.

H. W. Geromanos, dean of the Co-operative Engineering School in the Northeastern College of the Boston Young Men's Christian Association, was the speaker of the afternoon. Mr. Geromanos briefly described the Northeastern College as including the Evening Law School, the School of Commerce and Finance, the Co-operative Engineering School, the Polytechnic School, and the School of Liberal Arts.

He then spoke on the Co-operative Engineering School in detail.

This school offers to the student the opportunity to learn life in a commercial plant, and thus gain experience in getting along with men. In this way the boy can tell at an early date whether he is fitted for the work he has undertaken and at the same time "earn while he learns."

The school has been in operation eight years, during which time there has been a steady growth and an increasing interest on the part of the manufacturing and engineering firms which have given the students employment. While at first there was some difficulty in placing boys, the reputation of the school is now such that co-operating firms would take more boys than the school has to offer. There are now 161 boys taking the co-operative course.

The requirements for admission are seventeen years of age, a high school diploma, the successful passing of an entrance examination in elementary algebra, plane geometry, English, and, in case where the student's record is in question, elementary physics.

The courses offered are civil, mechanical, electrical, and chemical engineering, each requiring four years to complete. Each boy spends two weeks in the school, then two weeks with one of the twenty-seven co-operating firms of which

Aspinwall and Lincoln, Civil Engineers, Dennison Manufacturing Company, Boston Elevated Railway Company, and United Shoe Machinery are examples. The boys are paired as "alternates," the two boys of a pair exchanging places in shop and school at the end of each two-week period. The co-operating firms generally agree, where practicable, to give the boys experience in all the different departments of their establishments during the boys' periods of practical work. This insures a thoro and progressive course of training under industrial conditions.

The pay to the student is on the basis of ten cents per hour the first year, twelve cents per hour the second, fourteen cents per hour the third, and sixteen cents per hour during the fourth year. As tuition is only \$125 a year, a boy's earnings at the minimum give a balance for incidentals which makes the school particularly attractive to serious boys of moderate means.

The four years of school work are recognized as about equivalent to the first two years in the Massachusetts Institute of Technology, in the same courses. It is thus possible for a bright student to get his degree from Technology in two years after graduating from the Co-operative Engineering School.

—GEORGE M. MORRIS,

July, 1917.

NEW APPOINTMENTS.

In the hope of blocking strikes, quarrels and labor troubles of every kind in the country's most vital industries, Meyer Bloomfield has been appointed employment manager on government work at the Fore River Shipbuilding Yards, Quincy, Mass. Mr. Bloomfield is a graduate of Harvard, has been identified for a number of years with settlement work, is a close student of social, industrial and educational problems, and has been the head of the Vocation Bureau in Boston since its organization.

E. L. Bowman, formerly supervisor of industrial education for the state of Pennsylvania, has resigned to become director of vocational education in the city of Erie, Pa. In organizing his work for the coming year, Mr. Bowman plans to

(Continued on p. VIII.)

TEACH YOUR STUDENTS TO PROTECT THEIR CLOTHES WITH GOODRICK APRONS



They keep clothes free from dust and oils, and save many times their cost.

They add to the efficiency of the workman and give a class a neat, uniform and industrious appearance. Goodrick Aprons are easily washed and always look bright and clean.

They are made especially for the manual training boy, with large, roomy pockets and a rule and pencil pocket.

Made of fine quality 8 oz. white duck, strongly sewed, they will last through the entire course and may be resold. Made in sizes 29' x 36', with adjustable neckstraps, insuring every one a perfect fit.

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Write today for particulars and descriptive circulars.

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FIELD NOTES—(Continued from p. VI.)

begin prevocational work in printing, electricity, sheet metal and bench work in metal, in addition to the woodworking and mechanical drawing which has been given in the past. This work will be preliminary to vocational courses in the high school. The work in household arts will be reorganized and more time will be devoted to both manual arts and domestic arts.

E. W. Boshart, formerly principal of the high school at Binghamton, N. Y., has been appointed principal of the West Technical High School, Cleveland, Ohio. For three years Mr. Boshart was in charge of the railroad shop classes at Gary, Indiana, and for four years was director of industrial arts in the public schools of Mt. Vernon, N. Y.

Professor Arthur F. Payne, formerly of Bradley Polytechnic Institute, Peoria, Illinois, has been elected director of vocational education in Johnstown, Pa. This is a newly created position, made possible under the system of state aid for industrial education.

S. A. Blackburn, author of *Problems in Farm Woodwork*, has been elected to take charge of the manual training department at the North Texas State Normal College at Denton. Mr. Blackburn has just completed his work for a bachelor's degree at the Illinois State Normal University. Several years ago he was graduated from the two-year course at Normal and later from the two-year teachers' course at Bradley Polytechnic Institute. He has taught in Illinois, Minnesota and Texas. During the past few weeks he has been engaged in revising the manual arts section of the Illinois state course of study for public schools. It was a compliment to Mr. Blackburn's ability and educational standing that he should have been selected for this important work by the chairman of the State Course of Study Committee, Dr. L. C. Lord, president of the State Normal School at Charleston.

M. Norcross Stratton, for the past four years instructor of related work and practical arts in the Chestnut Street Junior High School of

Springfield, Mass., has accepted a position as instructor of related work and supervisor of agriculture at the State Normal School, Fitchburg, Mass.

Leon H. Baxter, who for the past three years has had charge of the industrial training and mechanical drawing in the public schools of St. Johnsbury, Vt., has been chosen head of the mechanical drafting department of the English High School, Lynn, Mass. Mr. Baxter is a native of Lynn and a graduate of the school at which he is to teach

Among the important changes in the field of educational administration and organization the following will be of special interest:

Dr. Frank E. Spaulding has left Minneapolis and this month begins his work as superintendent of schools in the city of Cleveland, at a salary of \$12,000. He is said to be the highest paid public school superintendent in the United States.

Dr. W. C. Bagley leaves the University of Illinois and his host of friends in the State of Illinois, and goes to Columbia University to organize a department for the training of experts in normal school education.

Dr. Edward O. Sisson, Commissioner of Education for the State of Idaho, becomes the president of the University of Montana.

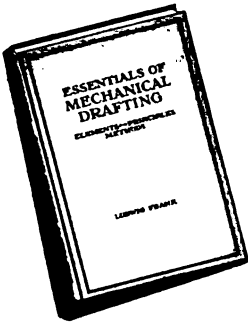
PATRIOTIC SERVICE.

Free courses for marine engineers and navigators have been started at Case School of Applied Science, Massachusetts Institute of Technology, Stevens Institute of Technology, Tulane University and the University of Washington.

Armour Institute offers short courses for the Mercantile Marine Service, beginning October 1st, 1917. Preparatory courses of four weeks will be offered to applicants with no experience and part-time courses of four weeks to partially equipped men. Preparation is also under way to train telegraphers and radio operators for the Signal Corps.

Aviation Schools for training candidates for

(Continued on p. X.)



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CONTAINS a larger amount and variety of material and more interpretative sketches than any book on the market. Instructors of mechanical drafting will find this the most complete volume ever published on this subject. It contains in one volume a definite comprehensive text, comprising the elements, principles and methods of mechanical drafting and their practical application. Each chapter is remarkably inclusive and so arranged that the consideration of its subject matter may be taken up regardless of the position of the chapter in the book.

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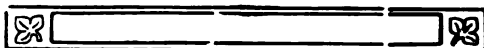
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FIELD NOTES.

(Continued from p. VIII.)

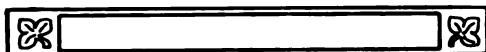
the Aviation Corps have been established at the University of California, Cornell University, Georgia Institute of Technology, University of Illinois, Massachusetts Institute of Technology, Ohio State University, Princeton University and the University of Texas. The first Navy Aeronautic School has also been established recently at the Massachusetts Institute of Technology.

Dunwoody Institute, Minneapolis, has completed arrangements for training men needed in the Government service and is now an enlisting station for all branches of the army and navy. Four hundred mechanics and technicians have been recruited for the different branches of government service. Four motor truck companies, two radio, one wire, one baking and one cooking company have been organized. The school is now training men in radio and telegraphic work. In addition, training is given in electricity, copper-smithing, baking, cooking, shipfitting, shipwrighting, gas engine, and radio for the navy.

The election of Frank H. Shepherd, as president of the Vocational Education and Practical Arts Department of the N. E. A., is a very appropriate recognition of the vigorous work he has done during the past few years at the Oregon Agricultural College. Immediately after he entered upon his work in Oregon it became evident that he regarded his field of effort not merely the State of Oregon, but the entire Northwest. Through correspondence and printed matter going out from the College, and by getting strong men to assist him in his summer school, he has made Corvallis, Oregon, a center for instruction in the industrial arts. Even this year, when other summer schools registered from 50 to 75 per cent of their usual attendance, his department was only seven students short of last year.

Edward M. Healey, one of the pioneer instructors in manual training, died at New Haven, Conn., on May 23d. For twenty-three years he has been the head of the Department of Carpentry and Patternmaking at Pratt Institute. Before that he was in charge of the manual training at the New Jersey State Normal School at Trenton, and still earlier he was an instructor

(Continued on p. XI.)



FIELD NOTES.

(Continued from p. X.)

in woodworking at Stevens Institute, Hoboken, N. J. He was one of the first, if not the very first manual training instructor in New Jersey. At Pratt Institute, Mr. Healey won a large place for himself thru his ability as a leader and his devotion to his work.

During the past ten years Mr. Healey has been successfully developing and conducting a summer camp for boys on a beautiful island in Androscoggin Lake in the State of Maine. He has built up a strong organization of nearly fifty boys and councilors. This is merely another evidence of the winning personality of the man.

The annual conference of State Administrators of Vocational Education held July 13th and 14th at Mechanics Institute, New York City, was attended by 45 representatives of eleven states: Connecticut, District of Columbia, Indiana, Iowa, Massachusetts, Minnesota, Missouri, New Jersey, New York, Pennsylvania, and Wisconsin.

Employers, labor men and educational administrators discussed present day industrial needs and how the vocational schools could aid in meeting the labor demands.

More than 1,000 boys and girls are entering the high schools in Lynn, Mass., this fall, and each one met and conferred with John C. S. Andrew, the vocational adviser, before school closed last June. Mr. Andrew explained fully what each high school stood for, and its relation to the various lines of life work that pupils might consider. The data obtained from the students concerning their future plans will be placed in the hands of the high school principals. This connects each pupil up with his interests and will enable the principal to deal with him intelligently.

The Rural Schools Department of the State Normal College, Kent, Ohio, is doing a fine work for education in the rural districts of the north-eastern part of the state. In less than three years the consolidated rural school has proved its worth in a number of townships, thru the co-operation of the Normal College. The rural school problem has been chosen as the particular field of the Kent Normal College, and it there-

(Continued on p. XII.)



The Finish is Important

SURELY this is a subject which should be given its share of attention, for a beautiful model may be ruined if improperly finished, while the defects of a poorly constructed model are minimized if well finished.

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The author has kept in mind the fact that he is addressing the boy who knows nothing of the subject, and to this end fundamental principles underlying the various processes have been explained fully.

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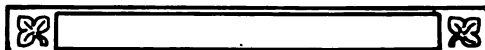
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FIELD NOTES.

(Continued from p. XI.)

fore specializes in training the kind of teachers needed in consolidated rural schools and township high schools.

The Board of Education in Minneapolis has been asked to appoint a corps of women to aid in vocational guidance in the high and junior high schools of the city. D. H. Holbrook, of the attendance department, pointed out that the need is for a large number of competent women who can help students find their life work. The Board sent three young women East the past summer to study various phases of vocational guidance work, and when school opens in the fall plans for further development of this work will be mapped out.

A survey of the schools of Omaha, Nebraska, was made recently under the direction of Dr. George B. Strayer, of Columbia University. Among other things Dr. Strayer's report recommended more attention to the needs of pupils between twelve and sixteen years of age. Miss Myrtle Fitz Roberts has been appointed director of vocational guidance, and H. W. Anderson, of Iowa City, Iowa, has been appointed director of research, to work under the direction of superintendent Beveridge.

The School Arts Magazine has recently been sold to the Davis Press, Worcester, Mass., the original owners. Changes in the personnel of the editorial board have been made as follows: Editor, Miss Anna L. Cobb, Head of Normal Department, Cleveland School of Art, Cleveland, Ohio; Managing Editor, Henry Turner Bailey; Contributing Editors, Royal B. Farnum, Director of Industrial Arts, State Department of Education, Albany, N. Y.; Ellsworth Woodward, Newcomb College, New Orleans, La.; Miss Florence E. Ellis, Cleveland, Ohio.

The officers of the Western Drawing and Manual Training Association are already laying plans to make the St. Paul meeting next year a great success. Special effort will be made to have a large registration from the state. The publicity work has already begun which shows how well the plans are organized.

(Continued on p. XIV.)

MAYDOLE HAMMERS



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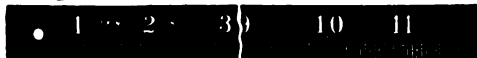
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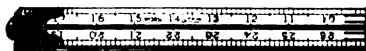
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FIELD NOTES.

(Continued from p. XII.)

A Conference on Vocational Education was held at the University of Iowa on June 20 and 21. Its purpose was to secure a clear understanding of the Smith- Hughes Bill and to determine the most advantageous use of its provisions so far as the State of Iowa is concerned. Members of boards of education, superintendents, principals, teachers and others specially interested were invited. The leading educators in the state took an active part in the conference. Arthur D. Dean, of Albany, New York, and W. F. Book, of Indianapolis, Indiana, each gave two addresses during the conference.

For some time the Government has been urging young men and young women stenographers to take the examinations for Government service. The supply is not equal to the demand, hence everyone passing the examination is sure of immediate appointment. The entrance salary ranges from \$900 to \$1,200 per annum, and advancement of capable employees is reasonably rapid. Examinations are held every Tuesday in 400 principal cities. Detailed information can be secured by writing to the Civil Service Commission, Washington, D. C.

The Manual Training School of Washington University, famous as the original manual training school organized by Dr. Calvin M. Woodward, is to become one of the junior high schools of the public school system at St. Louis. The School Board has purchased the site of the Manual Training School and the Smith Academy for \$300,000. Readers will recall that this is not the original site where the school opened in 1880 but is the later "new" site in the residence district of the city and not far from the new site of Washington University.

As a part of the "preparedness campaign" carried on in New York City, fourteen high schools entered a competition for patriotic posters. The condition of the contest was that the work must be done out of school hours and without the assistance of the class teachers. From twenty to fifty posters were entered by each school, and the quality of the work produced was a credit to both the art teachers and the pupils. First and

(Continued on p. XVIII.)

THE "RACINE" HIGH SPEED METAL CUTTING MACHINE



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For many years, in all branches of science, Kewaunee Laboratory Furniture has been recognized as the American Standard. It has stood for Educational Ideals and Educational Efficiency.

Today Kewaunee occupies the same position in the Manual Training field.

Better — of course; more expensive — inevitably; but infinitely preferable for the school that develops ideals as well as muscles. Our experience is at your disposal.

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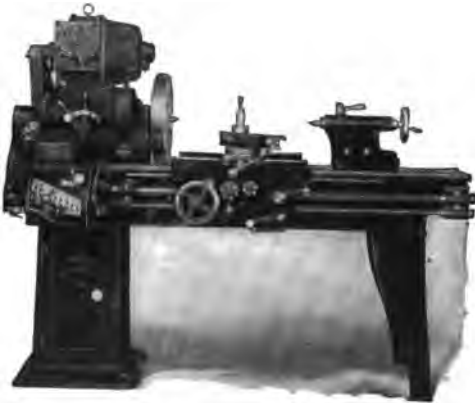
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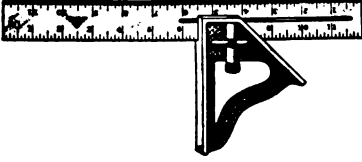
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The *Blade* is adjustable and as it can be reversed, provides any size of try or mitre square within the capacity of the tool. In reversing, it is not necessary to remove the blade from the handle, consequently the tool is always assembled and ready for use.

The edges of the blade are machined, graduated in 8ths, 16ths and 32nds of inches, and the tool is square inside and out.

The entire tool is nickel plated. Made in three sizes: 6 inch, 9 inch or 12 inch blades.

**STANLEY RULE & LEVEL CO.
NEW BRITAIN, CONN. U.S.A.**



FIELD NOTES.

(Continued from p. XIV.)

second prizes, a gold and silver medal respectively, were awarded. The following were invited to act as judges: Edwin H. Blashfield, of the Mural Painters Society; Frederick B. Williams, president of the Salmagundi Club; Albert S. Bard, president of the Municipal Art Society; Edward Robinson, director of the Metropolitan Museum; and F. G. Cooper, the well-known designer.

Hereafter the continuation schools in the state of Wisconsin are to be called vocational schools, and their work will be termed vocational education. This change was officially ordered in the last revision bill passed by the legislature which made a number of corrective changes in the continuation school law.

Under the direction of the manual training department, pupils in the Boys' High School of Reading, Pa., who are taking the manual training course will erect a building on the fair-ground to be used for the display of the articles that are made each year by the students. The structure will be frame and will be about 20 by 24 feet.

With the co-operation of the Portland Cement Association, the Department of Industrial Education of the University of Chicago offered a course of lectures in concrete this past summer. It was given by engineers and teachers thoroly familiar with the cement industry, including its possibilities as a school subject.

In less than three months after President Wilson had signed the Smith-Hughes bill twenty-nine legislatures had accepted the provisions of the bill. This fact suggests something of the trade in equipment and supplies that will come as a result of this movement.

By the will of the late Mrs. Julia Ainsworth Kent, the Industrial School of Rochester, New York, has received an unconditional bequest of \$15,000. Mrs. Kent had been a patron of the school since its earliest days.

(Continued on p. XIX.)



FIELD NOTES.

(Continued from p. XVIII.)

Robert Craig of the Technical High School, Indianapolis, is spending this year in study at Teachers' College, Columbia University.

The foundations are in for one wing of the new \$250,000 practice high school at the University of Illinois. Plans for the manual arts in this school, it is said, call for as good an equipment as can be found anywhere.

A. R. Wilson, who taught at the Hall township high school last year is in charge of the manual training at Champaign, Illinois.

W. T. Breit, assistant in manual arts at the University of Missouri last year, has accepted the offer to teach manual training in one of the state agricultural high schools in Arkansas.

In New Jersey the school year for a county vocational school begins on the first day of July and ends on the thirtieth day of June.

The most complete school printing outfit in the State of Oklahoma has just been installed in the high school at Ardmore. The work is to be in charge of a practical printer.

The boys in the Condon School, Detroit, Michigan, completed 1,500 drawing boards just before the close of school in June.

The boys in the summer vocational schools in Kansas City, Mo., built a school cannery, a new unit at the Lathrop School and one at the Lincoln High School, in addition to considerable repair work.

Charles W. Lombard, formerly instructor in manual training at Gardiner, Maine, has been placed in charge of the manual training in the junior high schools at Lynn, Massachusetts.

Thru a bequest of \$250,000 made by General Charles H. Pine, of Ansonia, Conn., a trade school will soon be built in that city.

R. E. Chloupek, for five years director of manual training at Pendleton, Oregon, has resigned to enter the American National Bank of that city.



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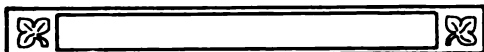
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Illustrating and explaining how to Joint, Set and File Saws. This booklet is now being used by a great many manual training teachers as a text book. One copy free to teachers upon application. Additional copies:

5 cents each
25 cents per 10
\$2.00 per 100

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TRADE NOTES

A blue-print circular giving the specifications and a design drawing of nail hammers has just been received. The reason for every distinguishing feature of this hammer is clearly indicated. It shows that careful thought as well as good workmanship has entered into the design of this tool. The points especially noted are (1) the double tapering or binding eye with clinging wedges in the end of the handle so that it will not work loose; (2) the crowning claw to prevent denting the wood and to readily grasp the nail that is being pulled; (3) the inside bevel of the claws to hold the nail firmly; (4) the ends of the claws shaped for use in prying or ripping; (5) the crowning face to prevent marring the wood when driving the nail; and (6) the "hang" of the hammer. These hammers are made by the Vaughan & Bushnell Mfg. Co., Chicago.

H. Channon Co., Chicago, announce that they have been chosen Illinois distributors for the sale of the New York Study Chair. In these days of the wider use of school buildings, the advantages of this type of chair are apparent. It combines a pedestal desk and seat, and is not attached to the floor. The desk top has a vertical adjustment and rotates sufficiently to permit easy access to the seat. Textbooks, stationery, etc., are kept in two locker drawers under the seat, and a rack is provided at the side of the pedestal for a dictionary and other ready reference books. Bulletin No. 62, entitled "Correct School Seating," contains a complete description of this chair, together with several modifications of it. A copy will be sent on request.

Information needed at every turn in the days work of machinists, toolmakers, etc., is brought together in most convenient form on a reference table just put out by The Lufkin Rule Co., Saginaw, Michigan, manufacturers of complete lines of rules, scales, measuring tapes, etc.

To be most suitable for carrying in the mechanic's pocket, this article, known as No. 97, is made of flexible spring steel, 1½-inches wide and 6¼-inches long. On one side appear machine screw tap sizes, each followed by tap drill size number and its decimal equivalent, and the corresponding body drill size number and its deci-

(Continued on p. XXII.)

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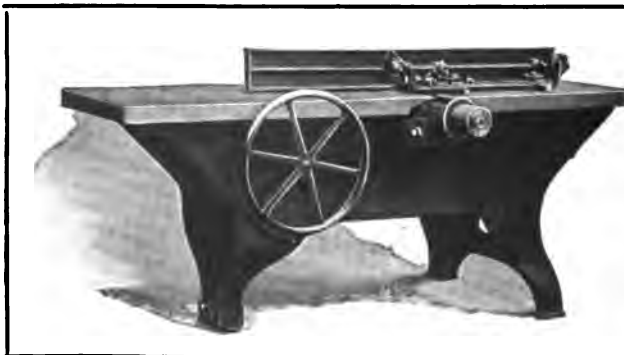
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Grand Rapids, Mich.

TRADE NOTES.

(Continued from p. XXI.)

mal equivalent, commonly known as the outside diameter size. On the opposite side of the scale is a complete set of decimal equivalents of fractions, and at the foot an inch graduated to 64ths. It sells for 50 cents. Circulars of this new article are to be had on request.

Henry Disston & Sons, Inc., Philadelphia, have inaugurated a monthly house organ for employees of the company, the first issue of which appeared July 2d. The title of the publication is "Disston Bits" which has a double significance, "bits" being another name for the teeth of inserted tooth saws, one of the company's products.

As the announced purpose of the publication is the stimulation and crystallization of good will and fellowship among the employees, it has been considered desirable that all illustrations, cartoons and editorial matter be the work of the employees themselves, therefore the paper is being published along these lines.

"Disston Bits" has eight pages, 9 x 12, and comprises several departments, including Editorial, Sports, Safety First, etc.

Protection of students' clothes while engaged in any form of shop work is a factor in efficiency, in addition to the workmanlike appearance that it gives a class. The P. C. Goodrick Company, Fond du Lac, Wisconsin, have given special attention to the manufacture of the proper kind of a shop apron for manual training classes. They are made of either white or brown duck, and sold at a reasonable price.

This firm also manufactures a shop coat for

(Continued on p. XXIV.)



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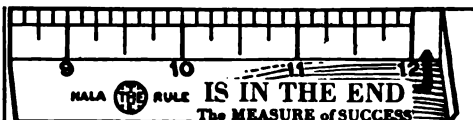
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TRADE NOTES.

(Continued from p. XXII.)

the instructor which appeals at once to anyone who appreciates the value of a good personal appearance under all conditions. Just now at the opening of school is the time to send for fully descriptive circulars.

Milton Bradley Company announce the publication of "Essentials of Mechanical Drafting" by Ludwig Frank. The book is described as a "drafting encyclopedia and textbook in one volume." A complete descriptive circular will be sent to anyone interested.

The latest catalog of E. C. Atkins & Company, Indianapolis, Indiana, is entitled "Atkins Silver Saws for Manual Training Schools." It contains illustrations and list prices of their entire line of manual training saws. A copy will be sent to manual training instructors, superintendents and principals of school, if requested.

The development of printing as a school subject is indicated in some degree by the number of books that have been published on the subject. The latest one is "Printing," by Frank S. Henry, published by John Wiley & Sons. It is a textbook for apprentices, continuation classes, and general school use. The author is instructor in printing at the Philadelphia School of Trades. Upon request a copy of the book will be sent to teachers for examination.

Thru a process of refinement the hack saw has become the high speed metal sawing machine; it has become a machine tool. The metal sawing machines manufactured by the Racine Tool & Machine Co., of Racine, Wisconsin, represent the highest development in this class of tools. Using the Racine H-S Tungsten Blades and a special cooling system, the percentage of saving in time over the ordinary former hack saw places the Racine tool in a class by itself. Moreover, the thinness of the blade used and the accuracy of the cutting is said to save enough material to pay for the machine many times over. This is another case where the development of a very simple tool has greatly refined an ordinarily rough industrial process.

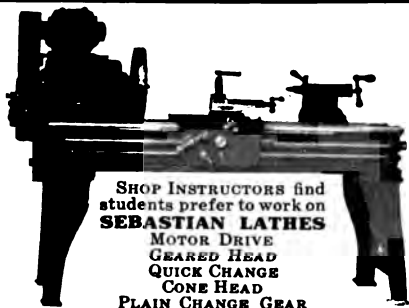


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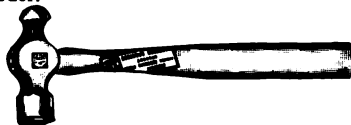
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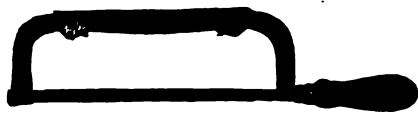
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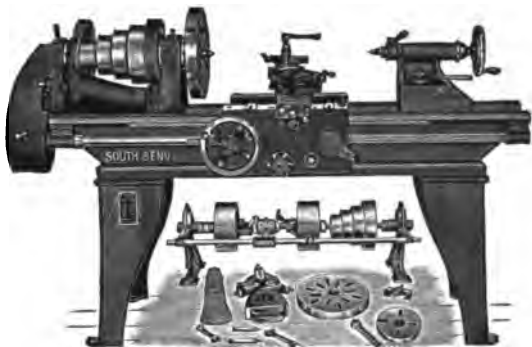
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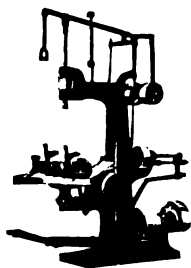
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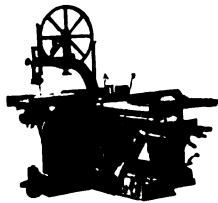
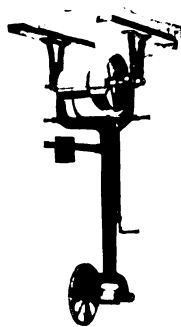
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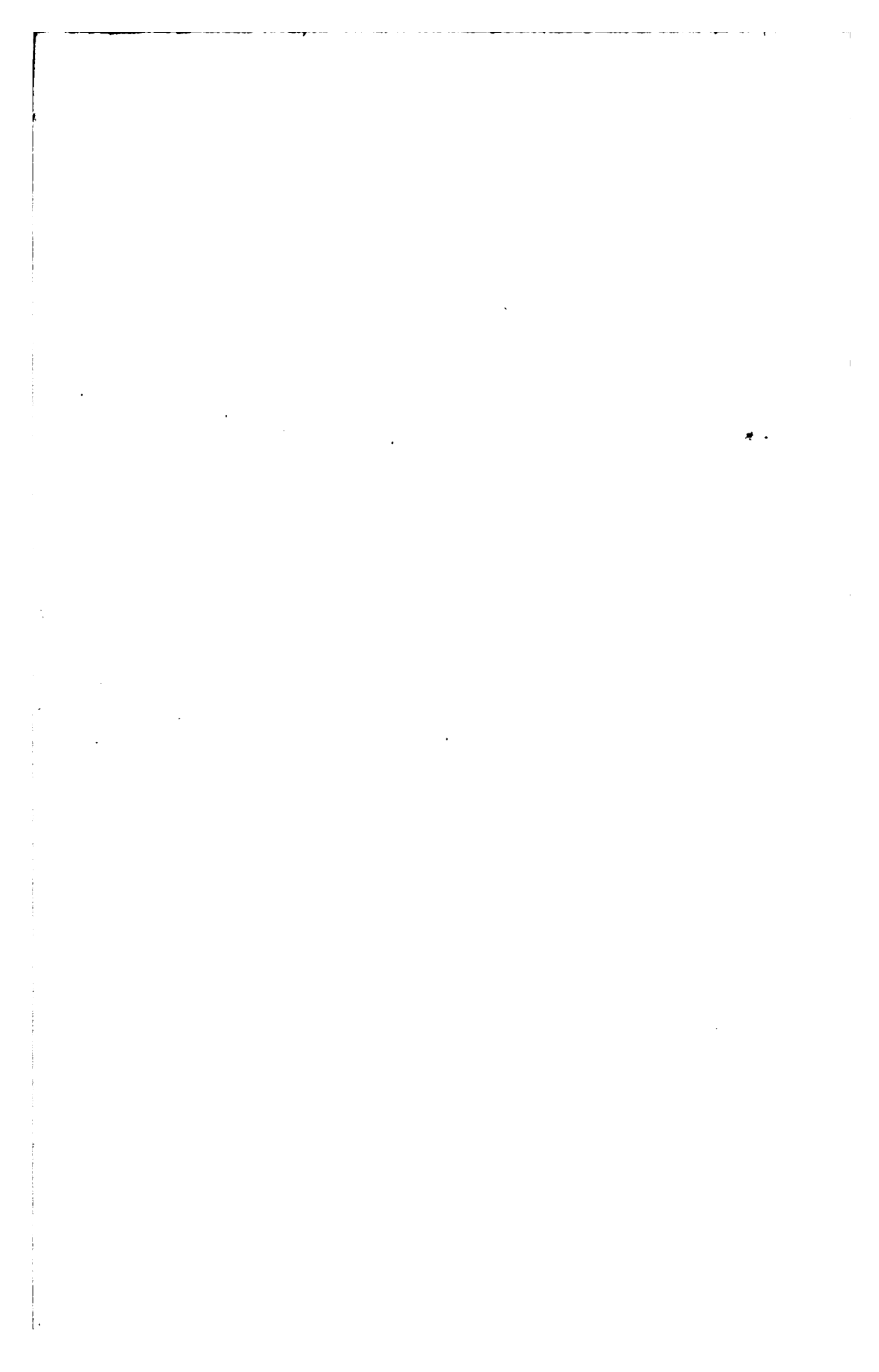
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